# EXPENDITURES ON CLIENTS RECEIVING TREATMENT FOR BOTH MENTAL ILLNESS AND SUBSTANCE-USE DISORDERS:

## RESULTS FROM AN INTEGRATED DATA BASE OF MENTAL HEALTH, SUBSTANCE ABUSE, AND MEDICAID AGENCIES FOR THREE STATES IN 1997

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Substance Abuse and Mental Health Services Administration
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December 2006

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## ACKNOWLEDGMENTS

This report was prepared by Thomson Medstat (Medstat) for the Substance Abuse and Mental Health Services Administration (SAMHSA) of the U.S. Department of Health and Human Services (DHHS) by Thomson Medstat under Contract No. 270-01-7087. Rita Vandivort-Warren, Ph.D. and Jeffrey A. Buck, Ph.D. served as Government Project Officers. The report was reviewed by analysts in States that contributed valuable data, time, and insights to the project: Maurice Tippett and Renata Henry from Delaware; Steve Davis from Oklahoma; Kenneth Stark and Toni Krupski from Washington State.

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### Recommended Citation

Coffey RM, Dilonardo JD, Vandivort-Warren R, Graver L, Schroeder D, Miller K, Adamson D, Forhan C. *Expenditures on Clients Receiving Treatment for Both Mental Illness and Substance-Use Disorders: Results from an Integrated Data Base of Mental Health, Substance Abuse, and Medicaid Agencies for Three States in 1997*. DHHS Pub. No. (SMA) 07-4263. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2007.

### Electronic Access

This publication can be accessed electronically through the following Internet World Wide Web connection: http://www.samhsa.gov. For additional print copies of this document or associated background reports, please call the SAMHSA National Clearinghouse for Alcohol and Drug Information, 1-800-729-6686.

### Originating Offices

Organization and Financing Branch, Division of Services Improvement, Center for Substance Abuse Treatment, and Office of Organization and Financing, Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, 1 Choke Cherry Road, Rockville, MD 20857.

DHHS Publication No. (SMA) 07-4263
Printed 2007

## Executive Summary

People who have both mental illness and substance-use disorders often have a difficult time understanding their own problems and finding professional help. The fragmentation of the U.S. health care system and the frequently separate treatment systems for mental illness and substance-use disorders create hurdles for these individuals. Health care policymakers have recognized and challenged the system of programs and providers in these fields to face the issues of clients with multiple disorders in a more coordinated way.

One of the barriers to improving services for people with co-occurring mental illness and substance-use disorders (MI&SUD) is the paucity of accurate information on them. Prevalence estimates vary widely, depending on the combinations of conditions studied, the instruments used to diagnose conditions, the timeframe of the client's life examined, and the settings and sources from which data are collected. Furthermore, there are very few studies of the *costs* of treating clients with co-occurring MI&SUD, however defined.

This study of *Expenditures on Clients Receiving Treatment for Both Mental Illness and Substance-Use Disorders* was funded by the Substance Abuse and Mental Health Administration to address the gap in information on the cost of treating clients with these co-occurring disorders in the public sector. Although the data are from 1997, they were a rare source for studying expenditures across multiple States and multiple State agencies involved in treatment of people with MI&SUD. The study analyzed treatment expenditures per public client in three States—Delaware, Oklahoma, and Washington State—after linking client data in each State across three public programs—mental health, substance abuse, and Medicaid agencies. Client data linked across multiple agencies were essential to understand fully the treatment of clients with such co-occurring disorders.

The study estimated expenditures on clients with co-occurring MI&SUD and compared those with expenditures on clients with a single type of disorder—mental illness (MI only) and substance-use disorders only (SUD only). "Clients with co-occurring disorders" were defined in this study to include patients who were either receiving both MI and SUD services or had both types of diagnosis recorded by a mental health or substance abuse treatment program during 1997.

To meet the challenges of linking these data and using them for an expenditure analysis, the methodology applied probabilistic linking to identify the same client in different data systems, utilized imputation techniques for missing expenditures, validated total expenditure estimates against external sources, and devised a special counting algorithm to avoid double counting of expenditures for the same client services recorded by multiple agencies. The estimates of average cost per client per year reflected the amount State programs spent per client per year, regardless of whether the client was continuing treatment in 1997 that was started in a prior year or starting care in 1997 that may have been completed in the next year. On an episode-of-care basis (not studied here), the estimates of expenditures on clients with MI&SUD may be even more disparate from expenditures on those with MI only or SUD only.

The numbers reported here are *estimates* of expenditures made for three States with mental health and substance abuse (MH/SA) treatment services through three types of State programs—mental health (MH), substance abuse (SA), and Medicaid agencies. The expenditure estimates did not capture the spending on treatment of MI and/or SUD that may have occurred outside these programs in other State government departments (e.g., corrections, education, or child welfare) or other public or private systems or entities.

The results revealed:

- **Substantial Co-occurring Prevalence:** Of the total population in treatment in the public MH, SA, and Medicaid programs of the three States, within the one year period studied, a substantial portion had both MI&SUD—11 percent overall. Of the population with any SUD, 36 percent overall—up to 60 percent in one State—had co-occurring MI&SUD. For the population with any MI, 13 percent had both MI&SUD. Thus, co-occurring disorders were frequently diagnosed among the populations treated in public programs, and it was especially frequent for clients of SA agencies.
- **Higher Total Costs**: Clients with co-occurring disorders consumed a disproportionate share of resources compared with clients with only one type of disorder. Of the total dollars spent on clients with MI only, SUD only, and MI&SUD, 20 percent of the dollars (13 to 32 percent depending on the State) supported services for clients with co-occurring MI&SUD disorders, who constituted 11 percent of the clients (7 to 17 percent depending on the State). Annual expenditures per client with co-occurring disorders in 1997 ranged from $5,000 to $11,000 (depending on the State), which were nearly twice as high as spending for clients with MI only and nearly 4 times as high as spending for clients with SUD only.
- **Spending Greater Than the Sum of Two Treatments**: The expenditures per person treated for both disorders was larger than the *sum* of the per-person expenses for the two single types of disorder—21 to 36 percent larger than the sum of the two across the States. However, for youth compared to adults this differential was much greater. For youth, expenditures for clients with co-occurring disorders was 56 to 90 percent higher, and, for adults, it was 9 to 35 percent higher than the sum of the spending for two single types of diagnoses.
- **Use of Most Costly Services:** Clients with co-occurring disorders compared with clients with a single type of disorder, received more of the most costly treatment services—hospital inpatient and residential. Although they were more likely to be admitted to the hospital, as inpatients they did not stay as long as clients with MI only. However, once admitted to residential treatment, they stayed longer than clients with a single type of disorder.
- **Higher Use of Medications for Severe Mental Illness:** Clients with co-occurring disorders, relative to those with MI only, were more likely to receive psychotropic drugs that were typically used for major mental illnesses—schizophrenia and bipolar manic-depressive disorders—suggesting that their mental disorders were most likely to be more severe. They also were more likely than clients with MI only or with SUD only to receive nearly all classes of psychotropic medications, except for drugs specific to the treatment of substance-use disorders.

- **Different Client Characteristics:** Clients with co-occurring disorders were more likely to be adults over the age of 18 and were more likely to be male, but were less likely to be minorities than are clients with a single type of disorder.
- **Primary Responsibility of MH/SA Agencies:** Clients with co-occurring disorders were also more likely to be the exclusive responsibility of MH/SA agencies rather than Medicaid's responsibility. Across the three States combined, 66 percent of clients with co-occurring disorders received services only from MH/SA agencies, while only 10 percent received services from Medicaid agencies only and 25 percent received services from both.
- **Not the Highest Inpatient Spending:** Clients with co-occurring disorders incurred inpatient expenditures per patient that were less than clients with MI only and more than those with SUD only. While clients with both disorders cost the State $7,000 to $17,000 annually per person on average for inpatient services across the States, clients with MI only cost $9,000 to $35,000, and clients with SUD only cost $3,000 to $7,000. (These estimates were averaged over the subset of clients receiving inpatient services, but the pattern also held true when averaged over all patients with co-occurring disorders and mental disorders).
- **Highest Outpatient Spending:** Clients with co-occurring disorders had higher outpatient expenses in comparison to clients with a single type of disorder. Those expenses were 40 to over 100 percent higher than those of clients with MI only and 145 to about 245 percent higher than those of clients with SUD only. The average amount spent for outpatient treatment was $2,700 to $4,600 per client with co-occurring disorders.
- **Comparable Medication Spending for Clients with MI only:** Expenditures on prescribed medications for clients with co-occurring disorders who received drug therapy was about $400 to $600 per person per year. The comparable medication spending range for clients with MI only was the same—$400 to $600 (although the relative MI&SUD to MI only costs varied by State). The medication spending range for clients with SUD only was $100 to $200; few clients with SUD only received drug therapy.
- **Higher Spending for Youth versus Adults:** Expenditures per youth with co-occurring disorders were greater than per adult with co-occurring disorders. Expenditures per youth with co-occurring disorders also were much greater than youth with MI or SUD only, because the former used more inpatient and residential services than the latter.

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# Chapter 1. Introduction

*When she arrived at St. Elizabeth's Hospital in Washington, D.C., Janice Grady heard what sounded like a death sentence. "They suggested drug treatment and I said, 'If you send me there I'm dead,' because I had been through drug treatment before. I knew that something else was wrong with me," Ms. Grady says.*

*Over 12 years, Ms. Grady was treated several times. During periods of recovery, she attended Federal City College and worked as a nurse and as an assistant director of a drug rehabilitation center. She wanted to stay off drugs, but other problems lurked. She was suicidal before the age of 13. At 14 she was raped and became a teenage mother. "Drugs were a way of dealing with those feelings," she says.*

*So in 1990 when a doctor from the St. Elizabeth's dual diagnosis program diagnosed her with depression, Ms. Grady says, "I cried, because someone said that there might be something else wrong with me." Now she understood why treatment of addiction, alone, was not enough. She subsequently was diagnosed with bi-polar disorder.*

*After 9 months of treatment, Ms. Grady entered an apartment at a women's residence, and received care at a mental health agency, including a weekly group for women with trauma and other co-occurring disorders, case management, and psychiatric help. She later earned a college degree and works at a treatment agency helping others with co-occurring disorders. Ms. Grady was in the stands cheering at her granddaughter's recent high school graduation. "I have never felt better," she says.*

*– SAMHSA, 2002*

People who have both mental illness and substance-use disorders face difficulties understanding their problems and identifying the professionals and programs that can best treat their multiple disorders. Whether under private insurance or in public programs, these clients often may not have access to a team of professionals who can handle all of their problems in one location or one program that facilitates follow-up for multiple problems. They may see a psychiatrist for their psychosis, go to an inpatient facility for detoxification, go to a separate addiction therapist for treatment for their substance-use disorder, and obtain other support from a clinical social worker (in the same or different program) for living arrangements and workplace integration, if they are persistent. More likely, they find treatment for one problem, receive advice to see another provider for the other problem, fail to follow the referral, and fail treatment because of their complicated, interrelated problems (SAMHSA, 2002).

Fragmentation, which pervades not only behavioral health care but also general health care, is doubly problematic for people who are not highly motivated to seek treatment. As a result, they may miss the opportunity to receive motivational assistance, receive treatment, and recover from substance use. These individuals must incur higher health care costs than necessary as they bounce in and out of treatment and ultimately face serious health consequences which result in expensive care—emergency care, hospitalization, residential treatment, and repeated use of these services. Another complicating factor in the coordination of care is that some clients receive services under multiple programs—the State Mental Health and/or Substance Abuse Agency, as well as the State Medicaid Agency.

Because persons with co-occurring disorders may be involved in multiple service systems, each with its individual data system, one of the barriers to improving services for people with co-

occurring mental illness and substance-use disorders is the paucity of accurate information on them within the context of the full service system. Further, prevalence estimates continue to vary widely and there are few studies of the *cost* of treating clients with co-occurring mental illness and substance-use disorders. Also, the Institute of Medicine Report, *Improving the Quality of Health Care for Mental and Substance-Use Conditions*, specifically recommends that States should move to "increase the use of funding mechanisms that link some funds to measures of quality" (IOM, 2006, p.19). Knowing the cost of treating persons with co-occurring mental illness and substance-use disorders could serve not only as a comparison point for future improvements in the coordination of care, but also as additional motivation for State systems to change.

SAMHSA previously published a report that provided descriptive information about persons with co-occurring mental illnesses and substance-use disorders and their service utilization, but information about expenditures for care was not included (Coffey et al., 2001). The current study of *Expenditures on Clients Receiving Treatment for Both Mental Illness and Substance-Use Disorders*, funded by the Substance Abuse and Mental Health Administration, builds upon the previous report and addresses the gap in information on the cost of treating clients with these co-occurring disorders in the public sector. Although the data used to conduct this study are from 1997, they represented a rare source for studying expenditures across multiple States and multiple State agencies involved in treatment of people with these co-occurring disorders. The study analyzed treatment expenditures per public client in three States—Delaware, Oklahoma, and Washington State—after linking client data in each State across three public programs—mental health, substance abuse, and Medicaid agencies. Client data linked across multiple agencies were essential to fully understand the treatment of clients with co-occurring disorders. The study estimated expenditures on clients with co-occurring mental illness and substance-use disorders (MI&SUD) and compared those with expenditures on clients with a single type of disorder—mental illness (MI only) or substance-use disorder (SUD only). Client characteristics and patterns of service utilization were also studied.

**Organization of the Report**

Chapter 1 explains the challenges in identifying clients with co-occurring disorders and the diverse prevalence rates related to factors of diagnostic criteria and study methods. The background provides a context for this study so that its findings on utilization and expenditures can be evaluated in the context of other work. Chapter 2 describes the study methods. Chapter 3 presents the characteristics of clients with co-occurring disorders compared to the characteristics of clients with a single type of disorder. Chapters 4 and 5 summarize the results on utilization and expenditures, respectively. Chapter 6 presents the study conclusions and discusses policy implications and the need for further research. Chapter 7 notes State differences and the need for better information systems to address issues of clients who receive services from multiple programs. Appendix A describes the methods in detail. Appendix B contains tables of expenditures by age groups.

## The Difficulty of Studying the Costs of Co-Occurring Mental and Substance-Use Disorders

There are two main difficulties in studying the costs of co-occurring mental illness and substance-use disorders (MI&SUD). The first is defining co-occurring MI&SUD. The second is finding comparable data on expenditures across the two separate fields of care—mental health and substance abuse treatment providers—who are supported by three separate programs—State Mental Health, State Substance Abuse, and State Medicaid agencies.

Defining Co-Occurrence of MI&SUD

The Substance Abuse and Mental Health Services Administration has defined co-occurring mental illness and substance-use disorder as (SAMHSA, 2002):

> *Individuals who have at least one mental disorder as well as an alcohol or drug use disorder. While these disorders may interact differently in any one person (e.g., an episode of depression may trigger a relapse into alcohol abuse, or cocaine use may exacerbate schizophrenic symptoms), at least one disorder of each type can be diagnosed independently of the other.*

This definition stresses the independence of the two disorders. Yet, determining "independence" is inherently difficult. The difficulty lies in determining whether the client's symptoms of a mental illness is substance induced—that is, the direct physiological consequence of substance intoxication or withdrawal, medication use, or toxin exposure—or is independent of substance use. This difficulty is acknowledged in the introduction to the current *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV) (American Psychiatric Association (APA), 1994).

Identification of co-occurring disorders is challenging because it rests on three distinct diagnostic findings. First, it relies on an accurate diagnosis of a mental disorder. Secondly, it depends on an accurate diagnosis of a substance-use disorder. Third, it requires that a mental disorder be independent of a substance-use disorder, as opposed to being induced by substance use. The DSM-IV manual categorizes any symptoms of mental illness other than those directly related to intoxication or withdrawal as independent of the substance-use disorder. However, it further suggests that symptoms which develop within one month of substance intoxication or withdrawal or where the clinician believes that the medication is etiologically related to the disturbance may be sufficient for a diagnosis of a substance-induced mental disorder. These suggestions are presented as general guidelines, which allow for the use of clinical judgment in determining the most appropriate diagnoses (APA, 1994; Nunes and Rounsaville, 2006).

Two recent national studies have focused on estimating the co-occurrence of some types of mental illnesses with substance-use disorders in the U.S. household population. One estimate of co-occurrence of mental illness and substance-use disorders in the general household population was made for SAMHSA from the National Co-morbidity Survey–Replication (NCS-R) conducted between 2001 and 2003 (Kessler, 2005a). The results of this special analysis revealed the proportion of co-occurrence over two population bases and two time periods. Of those with a substance use disorder (SUD) in the last 12 months, about 60 percent also exhibited mental

illness (MI) within the year. Of those with SUD in their lifetime, about 72 percent also had MI at sometime during their lifetime. Of those with MI in the past 12 months, 9 percent also had SUD within the year. Of those with MI in their lifetime, 25 percent had SUD in their lifetime. These results indicate that mental illness is a common symptom with substance use for a large proportion of the U.S. household population that exhibits substance abuse or dependence.

It is important to note that the Kessler study did not include the diagnoses of schizophrenia or other non-affective psychotic disorders and did not factor out all substance-induced mental disorders (they factored out those only if the patient *thought* that the substance use caused the mental disorder) (Kessler et al. (2005b). These psychosis exclusions and the potential substance-induced inclusion undoubtedly affected the estimates of the prevalence of co-occurring disorders. Furthermore, Schuckit (2006) found that undiagnosed substance-induced mental disorders can lead to the inflation of published rates of co-morbidity between substance use and mental illness.

Another recent national study, the National Epidemiologic Survey on Alcohol and Related Conditions, applied the more conservative DSM-IV guidance for the substance-use timeframe (the one-month window, previously described) in examining the prevalence of co-occurrence of some types of mental illness in the general household population with substance-use disorders (Grant et al., 2004). In that study, when the mental illness occurred outside of the timeframe of the substance use, the mental illness was assumed to be independent of the substance-use disorder. Note that schizophrenia and other psychotic disorders were excluded. Grant and colleagues found that 18 to 20 percent of the general population with a substance-use disorder in the past 12 months also had an independent mood or anxiety disorder in that period; for clients in drug or alcohol treatment, the prevalence estimates for co-occurring mood or anxiety disorders were substantially higher (33 to 61 percent). Definitions for co-occurring prevalence and how such definitions must wrestle with factors of independence in closely related conditions, as well as the specific criteria used to identify mental and substance-use disorders are central to any prevalence estimate of co-occurring mental illness and substance-use disorders.

Some studies of the prevalence of co-occurring mental illness and substance-use disorders have been conducted on populations in treatment. Such studies differ in definitions used, methods employed, time periods viewed, and populations studied. As a result, estimates of the prevalence of co-occurring MI&SUD vary widely. In 26 studies conducted from 1990 to 2004, the prevalence of these co-occurring disorders varied from 84.7% in a study of opiate dependent clients in an outpatient methadone maintenance program (Abbott et al., 1994) to 4.4% among a population of privately insured patients with mental health claims who also had a primary or secondary diagnosis of alcohol or drug abuse or dependence sometime during a three year period (Garnick et al., 1996). In general, studies that used diagnostic interviews (Abbott et al., 1994; Kessler et al., 1997; Rutherford et al., 1999; Rounsaville et al., 1991, and Compton et al., 2000a and 2000b) showed higher prevalence rates than studies that used chart or insurance claim reviews (e.g., Garnick et al., 1996).

Further complicating such estimates, some clinicians would observe that clients may arrive at the substance abuse treatment facility with a diagnosis of an affective disorder (for example, anxiety), but this may be the result of the client not being ready to disclose their substance abuse

during the previous interview for diagnosis. Clinical staff may also suggest that for some clients symptoms may remit without other specific treatment, if the client's mental illness or substance abuse is successfully addressed; some support exists in the scientific literature for this observation (Verheul et al., 2000). Thus, clinicians may question in a common sense way, whether some clients truly have a mental illness which is "independent" of the other disorder, even if the time frames outlined in DSM-IV are exceeded.

In general, studies of the prevalence of co-occurring mental illnesses and substance-use disorders have varied on a number of dimensions. They have used:

- A variety of definitions of MI (e.g., all mental illnesses or severe mental illnesses), of SUD (differing substances, or abuse versus dependence); and of MI&SUD (e.g. Axis I (clinical conditions) or Axis II (personality disorders) or both; independent versus substance-induced MI)
- Multiple systems for classifying diagnoses (Feighner, DSM-III, DSM-III-R, or DSM-IV, or Research Diagnostic Criteria)
- Various methods for collecting data (self-administered questionnaires, short screening instruments administered by lay interviewers, long structured diagnostic instruments administered by clinicians, or insurance claims)
- Differing time periods (e.g., lifetime, past 12 months, beyond one month, current at time of observation)
- Divergent populations (e.g., households, treatment groups in specific programs; differing treatment settings (methadone clinics, inpatient hospitals, emergency departments, residential programs, public clinics))
- Different bases of comparison (e.g., SUD co-occurrence among people with MI or MI co-occurrence among people with SUD)

All of these dimensions influence prevalence rates greatly. As a result, there is no one or converging set of estimates of co-occurring MI&SUD disorders from the literature. The current study will contribute yet another point of observation.

Lack of Cost Estimates

The fragmentation of MI and SUD services across different providers and payers makes it difficult to estimate the expenditures for services for people with both disorders. To develop such estimates comprehensively, information from multiple payers, programs, and providers must be obtained and common clients must be identified. One way to do that is through health insurance claims for services.

There are few published studies related to the cost of care for people with MI who also had co-occurring SUD. Dickey and Azeni (1996) found that psychiatric care costs were 77 percent higher for people with co-occurring disorders compared to people without substance abuse among a Massachusetts Medicaid population in 1992; they included Medicaid and Department of Mental Health costs. Hoff and Rosenheck (1998) found that among people receiving psychiatric treatment in the VA health system in 1991, the cost of those with co-occurring diagnoses was 25 percent higher than those without co-occurrence. Garnick and colleagues (1996) examined charges from health insurance claims of three large companies and found higher costs for those

clients with MI who also had SUD than for clients with MI alone, even though this was an employed population, likely to have less serious conditions than those treated in the public sector.

**Purpose and Scope of This Study**

The primary purpose of this study was to estimate public expenditures for clients in treatment for both mental illness and a substance-use disorder (MI&SUD). To estimate the expenditures for MI&SUD in public programs, it was necessary to collect client-level data from programs treating both MI and SUD and to integrate data, identifying common clients in the programs that specialized in treating one disease or the other. In the public sector, because separate funding streams often cover mental health and substance abuse services, and because Medicaid also reimburses for these services, it was necessary to link records across these programs for the same individuals to obtain estimates of the complete expenditures for clients with co-occurring disorders.

SAMHSA had developed an integrated database of client records across multiple public programs—the Integrated Data Base (IDB) Project (a project of the Center for Substance Abuse Treatment and the Center for Mental Health Services)—that could be used to analyze the treatment and related expenditures for clients with both MI and SUD during a year. The IDB Project provides a rare opportunity to compare public expenditures on these clients with clients who are treated for only one type of disorder.

The IDB Project assembled records on services provided in 1997 by government organizations in three States—Delaware, Oklahoma, and Washington State. The database contained information from State MH, State SA, and Medicaid agencies on the behavioral health conditions of clients, their use of services, and level of expenditures. The IDB assembled data separately for the three participating States into three uniform databases and linked person-level and service-level information across the multiple organizations within each State database. The three States were selected for the project because they had the capability and interest in integrating the data across agencies within their State, so that they could better understand their clients and system of services

As previously mentioned, the first analysis of the IDB addressed utilization rather than expenditures (Coffey et al., 2001). Analysis of expenditures was complicated by methodological problems—deciding how to count expenditures for the same client, service, and date recorded by three different programs; dealing with missing expenditure amounts on service records; and understanding substantial differences in data collection across the States that affected expenditure estimates.

The current analysis attempted to address these problems and to identify and adjust for differences among the States. Because States reported spending annually, the timeframe of expenditure estimates in this study was annual. Estimates were all made for a uniform period—the calendar year 1997. One objective of this study was to acknowledge the State differences while gleaning the similarities among them that reveal how clients with co-occurring MI and SUD compared to clients with a single type of disorder along four major lines of inquiry:

- *The rate of co-occurring mental illness and substance-use disorder:* Did co-occurring MI&SUD affect a high proportion either of clients with mental illness (MI) or of clients with substance-use disorder (SUD) in treatment?
- *Client characteristics:* How did characteristics of clients in treatment for co-occurring MI&SUD differ from clients in treatment for MI only or SUD only?
- *Service utilization:* Did clients in treatment for co-occurring disorders use more inpatient and residential services, outpatient services, and prescribed medications than clients with a single type of disorder?
- *Expenditures:* How did expenditures per client with co-occurring MI&SUD compare to expenditures per client with a single type of disorder? Were the expenditures for clients with both disorders more or less than the sum of spending for clients with either single type of disorder?

This study was limited to the occurrence of mental illness and substance-use disorder within one year among those who sought treatment in public programs in three States, not among the general population and not across lifetime experiences. The treatments included all types of settings—inpatient, outpatient, and residential. The scope of this study was not restrained by diagnosis, but by the receipt of services. Identification of clients with both disorders was made through program administrative records. Those program records included intake records, records of services as submitted by providers (employed by government programs or in independent practice), and payment claims sent to Medicaid. Thus, the designation of "co-occurring" disorders was made through consolidation of client records that were for MH/SA programs, services, or payments or records that contained diagnoses for MI&SUD on any of those client records.

Because the data were consolidated from the records, the categorization of clients in this study is based on the assumed accuracy of the program staffs' clinical decision-making abilities. Detailed clinical data which would have allowed confirmation or re-categorization of clients' diagnoses were not available. Given that determining the independence of disorders is key to defining "co-occurrence" and because the SUD and MI evidence was frequently found to be recorded on the same date (see Chapter 2), the potential for overstating the prevalence of co-occurrence exists in this study. However, under-reporting of SUD in this study is also likely because the estimates were based on administrative data sources, which are known to under-report SUD (Rockett et al., 2003).

# Chapter 2. Methods Overview

This chapter defines the study population, discusses challenges of the methods, summarizes limitations of the study, and notes why results could vary by State. Methodological challenges existed because multiple data sources were used and because recording of expenditures naturally were duplicated across multiple programs that treated some of the same clients. The limitations related to the reporting of mental illness (MI) and substance-use disorders (SUD), identification of co-occurring MI&SUD, the inclusion of only three States, and the potential for bias in counting people, services, and dollars. Varying results across the three States might occur because of many differences among the State environments.

## The Study Population

This study of expenditures for MI only, SUD only, and co-occurring MI&SUD treatment included only clients whose treatment was funded by State agencies—mental health agencies, substance abuse agencies, combined MH/SA agencies, specific youth or adult programs, or Medicaid agencies. Only clients through age 64 who received some type of MI or SUD service during the 1997 calendar year were included. Clients over 64 year of age were excluded because the IDB did not link MH/SA agency and Medicaid records to Medicare records, and inclusion of such clients would have resulted in a large underestimation of expenditures for them.

## Methodological Challenges

The methodological challenges included:

- Identifying "co-occurring" disorders
- Using data from divergent sources
- Linking clients across data sources
- Counting services and expenditures

### Identifying "Co-Occurring" Disorders

Identifying patients with co-occurring disorders was the central challenge (and limitation) of this research. "Co-occurrence" in this study consisted of: 1) an appearance in the data of diagnoses for both conditions, during a one year period of time, 2) receipt of services for both conditions at any time during the year, or 3) some combination thereof.

There were two challenging issues in interpreting these data:

- Whether the MI and SUD diagnoses themselves were correct
- Whether co-occurring SUD with MI was defined independently of substance-induced MI

These challenges are discussed next, followed by an analysis of the types of evidence used to identify clients with MI, SUD, and co-occurring MI&SUD.

The accuracy of diagnoses of MI and SUD depended on how clinicians reported on clients in the three participating States. Given the complexities in applying the DSM-IV criteria to clients,

clinicians seeking reimbursement for services rendered may have been inclined to select a diagnosis for which reimbursement was certain. Because payment systems generally cover services better for MI than for SUD, such a bias would likely over-identify MI, under-identify SUD, and also under-identify co-occurring MI&SUD. Diagnostic imprecision in the field was undoubtedly reflected in the IDB administrative data. IDB data did not permit analyses of specific providers and their diagnostic practices or coding decisions. Nevertheless, the use of administrative data in this study improves knowledge of how those identified with co-occurring MI&SUD were treated within a year and at what expense.

Identifying co-occurring MI independently from substance-induced MI was a further challenge of this study. To understand the potential bias from this challenge, diagnostic classifications in this study were analyzed by the type of evidence available to classify clients.

The file of administrative records available for this study included client-level program admission records, service records, and payment claims. The client records contained from zero to six diagnoses. In this analysis, each client administrative record was reviewed across primary and secondary diagnoses and classified by whether that individual record reflected a client with MI only, SUD only, or MI&SUD. All of a client's individual records were then analyzed together to determine whether the client should be classified as having MI only, SUD only, or MI&SUD over the period of one year.

When no diagnoses were present on client records, which happened frequently for some types of State programs (see Table B.2.4), other proxies were used to identify clients with MI only, SUD only, and MI&SUD. The other proxies were: evidence of enrollment in a specialized *integrated* MI/SUD treatment program (a strong indicator of treatment for both conditions), evidence of a substance-use problem from an intake assessment, and/or evidence of a MI or SUD service. Evidence from an MI or SUD service, without diagnostic confirmation, might be considered the weakest proxy. However, restricting the study to clients with evidence from diagnoses was not viable because a majority of clients (about half of agency clients in the two largest States) would have been eliminated.

Table 2.1 summarizes the evidence for determining co-occurring MI&SUD within the calendar year 1997, the time period of this study. The table shows the proximity of the evidence in time and the type of evidence used. Proximity is measured by co-occurrence designation on the same date, within 30 days, within 60 days, within 90 days, or beyond 90 days (91 to 365 days). Type of evidence is noted in priority order by its strength as to whether the client was in an integrated program treating both MI&SUD, whether co-occurrence is determined from recorded diagnoses, whether the SUD side of the co-occurrence comes from a recorded substance use problem on an intake record, whether co-occurrence comes from a service provided in combination with other evidence, or exclusively from services.

Table 2.1 shows that indicators of MI and indicators of SUD for clients with co-occurring disorders in the study were identified in very close proximity to each other in two States and were fairly close in the third. Most clients (60 to 84 percent) were identified as having co-occurring disorders on the same date. Using a 30-day window, these data identified 84 to 92 percent of study clients with co-occurring disorders. Thus, most of the clients with MI&SUD in

this study are likely to have had both disorders during the timeframe of the DSM-IV criteria for substance-induced MI. However, this study could not determine reliably whether co-occurrence persisted past withdrawal and treatment for substance use because records past treatment were not available.

Table 2.1 also shows that the evidence used for identifying co-occurring mental illness and substance-use disorders for clients was determined mostly from intake evaluations with diagnostic screening, rather than from evidence of a service. Two States had intake evaluations for 74 and 90 percent of their clients; the other State had evaluations for 56 percent of its clients. Thus, a minority of clients in the States (10, 26, and 45 percent) were considered to be identified as having MI&SUD only because of some service received. Almost none of the evidence was based on services exclusively—only 0.0, 0.2, and 11.5 percent of the clients across the three States.

The next section describes more of the differences in the data among the three States.

**Table 2.1: Proximity and type of evidence for co-occurrence: Percent of clients with mental illness and substance-use disorders (MI&SUD) by proximity and type of evidence, by State**

| | DE (n=2,397) Percent | OK (n=15,604) Percent | WA (n=10,388) Percent |
|---|---|---|---|
| **Proximity of evidence–percent of clients with MI&SUD evidence:** | | | |
| On same date | 84.3 | 82.8 | 59.6 |
| Within 30 days | 92.1 | 91.1 | 83.7 |
| Within 60 days | 93.9 | 92.6 | 88.7 |
| Within 90 days | 95.2 | 93.8 | 91.9 |
| 91 to 365 days | 4.8 | 6.2 | 8.1 |
| **Type of evidence–percent of clients with MI&SUD evidence from:** | | | |
| Integrated programs | 5.3 | 7.1 | 2.9 |
| Integrated programs + diagnoses (cumulative) | 75.3 | 52.6 | 49.7 |
| Integrated programs + diagnoses + MI diagnosis and substance-of-choice indicator (any combination and cumulative) | 90.3 | 73.5 | 55.8 |
| Any of above + services (not cumulative) | 9.7 | 15.0 | 44.6 |
| Services only (not cumulative) | 0.0 | 11.5 | 0.2 |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

Using Data from Divergent Sources

The Integrated Data Base (IDB) project assembled data across different organizations supporting MH/SA services within each of the three States (see Table 2.2). Each organization served a specific population (defined either by eligibility criteria or by who "walked in" for services with that condition) and collected client-level and service-level records. Those records may "overlap" or "duplicate" records maintained by other organizations within the State that also managed MH/SA services for the same individuals.

For example, Delaware integrated MH and SA treatment services, but administratively separated two populations that received these services—MH and SA services for youth were managed under one program, and MH and SA services for adults were managed under another. Oklahoma had an integrated information system for MH and SA services, and both the MH and SA agencies were within one department which managed those services. Washington State maintained records for clients who received MH services separate from records for clients who

**Table 2.2: Summary of Three State MH/SA agencies, populations serviced, and potential for duplicate recordkeeping**

| State | Agencies Involved | Populations Served | Record Keeping |
|---|---|---|---|
| **DE** | Adult MH/SA agency | Low-income adults and elderly with persistent and severe mental illness (SMI) and/or substance-use disorders (SUD) who were not Medicaid eligible or who exceeded their Medicaid benefits. Also, non-managed-care Medicaid clients. | Overlapped with Medicaid |
| | Child MH/SA agency | Medicaid-eligible, SCHIP-eligible, and uninsured children. | Overlapped with Medicaid |
| **OK** | MH/SA agency | Low-income children, adults, elderly, and persons with chronic MI. MI/SUD emergencies without regard to income. | Overlapped with Medicaid |
| **WA** | MH agency | Low-income and SMI children and adults. Also, emergencies for higher incomes. | Overlapped with SA agency. Residential and Outpatient Services seldom overlapped with Medicaid because Medicaid payments for such services went directly to Regional Support Networks that functioned as managed care organizations. |
| | SA agency | Low-income youth, adults, families. Also, pregnant women, parents with small children, and youth. | Overlapped with MH agency and with Medicaid |

received SA services because separate offices managed those services. All three States' MH/SA agencies had records that were separate from and, thus, possibly duplicated or overlapped Medicaid records for MI/SUD clients.

Linking Clients Across Data Sources

Computer routines were used to link Medicaid and MH/SA agency service-level data (and for Washington MH and SA agency data) for the same individuals within each State. This linking was done by matching, when available, Social Security Numbers, Medicaid ID numbers (sometimes available in MH/SA files), first name, middle initial, last name, maiden name, date of birth, race, gender, and ZIP code. Because coding errors in such identifiers could have reduced the accuracy of simple direct matching, probabilistic linkage methods were used. With this method, the probability of a true link (and its acceptance) was based on the number and type of congruencies among identifiers across two files. As a result of this process, a unique, masked, uniform client identifier was assigned to each record from each source. All underlying personally identifiable information was removed from the files in compliance with State-specific rules and Federal regulations regarding confidentiality. (See Appendix A for more information on record linking.)

Integrating and linking these disparate data systems in the SAMHSA IDB Project made research such as this study of expenditures for clients with MI&SUD possible. For further information on the development of the IDB, see Coffey et al. (2001).

Counting Services and Expenditures

Combining data from separate administrative systems without taking into account duplicate and overlapping accounting of services between information systems created the potential for over-counting services and expenditures. Thus, the problems of parallel record-keeping had to be handled in the analysis of services and expenditures. There are three main challenges to using the IDB administrative data to estimate expenditures for services: missing expenditures, shared records, and accurate counting.

First, missing expenditures occurred because not all records included expenditures for services provided. The MH/SA agencies, for the most part, collected no payment information. However, during development of the IDB, where feasible, the States provided estimates of the expenses they incurred for specific types of services, and these estimates were applied to service records. Remaining missing expenditures were imputed (as described in Appendix A). Up to 15 percent of expenses that were missing and unable to be provided by State agencies had to be imputed.

Second, shared records may have existed when two information systems represented the same services for a client, primarily because both agencies maintained records for the same services, while one managed the services (e.g., the State MH/SA agencies) and the other paid for them (e.g., Medicaid). To avoid double counting from this double accounting, shared services were identified and tagged. This step was needed because the IDB processing assigned dollars to MH/SA agency service records based on their fee schedules, and in addition, this study imputed

expenditures to records that did not contain expenses. (See Appendix A for information on identifying and tagging shared services.)

Third, accurate counting required that only one side of the "shared" services be counted to avoid double counting. The challenge was to decide which data to use to count services and expenditures. To count the expenditures reliably, upper and lower bounds on service dollars were defined. The upper (or lower) bound represented the higher (or lower) of the two categories of expenditures on shared records. The upper and lower bound estimates were very similar, suggesting that shared records were paid comparably across programs.

One way to assess the overall validity of estimates from this study was to compare them, when possible, to estimates from outside sources. Table 2.3 compares subsets of estimates by State from this study to external estimates that were generated by the States for other purposes.

Table 2.3 shows that in some instances the estimates from this IDB study were very close, within 5 percent of the State estimate. In other cases, the estimates were quite different—58 percent different in one case.

Large differences in total expenditure estimates may have occurred because there were gaps in records for either source. Generally, estimates from this study should have been higher than the State-generated estimates for two reasons: 1) this study imputed missing values, and the State agency databases generally did not, and 2) this study imputed dollars for managed care records from fee-for-service records, which meant that any managed care discounts were not subtracted from the study estimates.

The higher estimates for this study compared to external sources in Table 2.3 occurred for Medicaid capitation payments, as expected. Medicaid capitation payments were made to programs that agreed under contract to treat Medicaid-eligible clients with behavioral health disorders under a fixed dollar amount per client per month, regardless of the services used. The large Medicaid capitation discrepancy initially estimated in this study was mostly attributable to Medicaid capitation payments recorded for clients that could not be found in Medicaid enrollment records during the record linkage process. Because of this large discrepancy, capitation payments were excluded from all States for the analyses performed for this study.

The reasons for the magnitude of three other smaller, but still substantial, differences were unclear. They remained as a warning of the pitfalls of combining information from different databases with different methods, definitions, time periods, and missing data among their records.

There was one final issue regarding accuracy of expenditures. These estimates of average expenditure per client per year reflected the amount State programs expended per client per year, regardless of whether the client was continuing treatment started in a prior year or starting care that may have been completed in a later year. Thus, these estimates did not necessarily capture all expenditures for an episode of care that a client started (or finished) in a year. To the extent that clients with MI&SUD had longer episodes of care than clients with a single type of diagnosis, expenditures for clients with co-occurring disorders on an episode basis may have had

been greater than measured here relative to clients with MI or SUD only. This difference is because the estimates here were calculated from a truncated one-year experience; this artificial truncation could have affected longer episodes disproportionately.

**Table 2.3: Estimates of aggregate State expenditures for clients with mental illness (MI) and with substance-use disorders (SUD) from the IDB study and from independent sources (when available), 1997**

| State program | IDB expenditure estimate, CY 1997 | State expenditures estimates, FY 1997 | Percent difference: IDB / State estimates | Sources for State agency estimates and notes |
|---|---|---|---|---|
| **Delaware** | | | | |
| State MH program expenditures for MI only (for adults only) | $ 54,377,862 | $ 53,277,593 | 2.1% | Lutterman et al., 1999. |
| State SA program expenditures (for adults) for treatment only | $ 12,162,187 | $ 11,633,740 | 4.5% | Gustafson et al., 1999. |
| Total MH program and SA program dollars for adults | $ 66,540,049 | $ 64,911,333 | 2.5% | |
| State MH/SA program for children | $ 21,832,564 | a/ | a/ | a/ No comparable estimate available. |
| Medicaid (including BH capitation payments) | $ 34,966,404 | $ 22,125,600 | 58.0% | The IDB Medicaid estimate includes $11.1 million of capitation payments by MH/SA agencies that did not link to Medicaid enrollment records. Other reports might not have included these. To obtain the external estimate, an FY 1995 estimate of $21 milion from Buck and Miller (2002) for clients aged 0-64 was inflated to the year 1997 by the 5.36% increase in State MH expenditures for 1995-1997 (Lutterman et al., 1999). |
| **Oklahoma** | | | | |
| State MH program dollars on MI only | $ 162,897,481 | $ 133,515,680 | 22.0% | Lutterman et al., 1999. |
| State SA program treatment dollars | $ 25,385,693 | $ 24,387,599 | 4.1% | Gustafson et al., 1999. |
| Total State MH/SA program | $ 188,283,174 | $ 157,903,279 | 19.2% | IDB includes $10.6 million imputed dollars that external amounts may not reflect. |
| Medicaid | $ 71,224,925 | a/ | a/ | a/ No comparable estimate available. No capitation payments included. |
| **Washington** | | | | |
| State MH program | $ 362,879,989 | $ 370,056,099 | -1.9% | Lutterman et al., 1999 estimate of $437,056,099, excluding dollars not in IDB:<br>--$19M not allocable to service settings;<br>--$7M for research/training/administration;<br>--$9M residential services of MH agency; and<br>--$32M MH agency share of payments to Resource Support Networks (RSNs). |
| State SA program | $ 85,351,035 | $ 85,679,708 | -0.4% | Gustafson et al., 1999. |
| Total MH/SA program | $ 448,231,024 | $ 455,735,807 | -1.6% | |
| Medicaid paid to MH agency for managed care | $ 170,000,000 | a/ | a/ | IDB estimate includes dummy records for 85% of $200 million that MH agency says Medicaid likely spent on RSNs in CY 1997 (or $170 million); the MH agency share of 15% ($30 million) has been added to State MH program dollars above.<br>a/ No comparable estimate available. |
| Medicaid (excluding capitation payments to RSNs and others) | $ 41,334,604 | $ 32,000,000 | 29.2% | The Center for Mental Health Services estimated $32 million excluding capitation payments and including recipients aged 65 and over (CMHS, 2004). |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007. For other sources, see References.

**Limitations of the Study**

The limitations of this study related to underlying data issues:

- Reporting of MI and SUD. Diagnostic criteria may not have been consistently applied by clinicians across multiple providers, settings, systems, and States. The IDB did not contain sufficient clinical detail on clients nor specialty detail on providers to attest to accurate clinical classifications. Further, the accuracy with which intake evaluations satisfy DSM-IV criteria for identifying MI, SUD, and MI&SUD was unknown. In addition, the bias that reimbursement incentives may have created would have varied by State but most likely would have favored MI against SUD. Other reporting bias may have stemmed from the descriptive nature of the DSM-IV coding system itself and the complexity in sorting substance-induced from non-substance-induced disorders.
- Identifying Clients with "Co-Occurring" Disorders. It is unclear whether prevalence of co-occurring disorders is underestimated or overestimated in this study. On the one hand, reimbursement incentives were likely to lead clinicians to report only information required for reimbursement and only the condition under treatment at the time. Furthermore, because diagnoses were not present on all client and service records, it was possible that some clients with co-occurring disorders were misclassified as clients with a single type of disorder. These biases could lead to conservative estimates of the number of clients with co-occurring disorders. On the other hand, Table 2.2 also indicates that the vast majority of clients identified with co-occurring disorders had evidence of both disorders within 30 days. However, longitudinal clinical detail was not available for sorting out independent from substance-induced MI. The fact that both diagnoses were considered independent for this study when they occurred within the one-month time frame recommended in DSM-IV for consideration of substance-induced mental disorders may mean that co-occurrence was over-estimated. Whether these biases are offsetting or tend in either direction is unknown.
- Limited Generalizability. The three States in the IDB were selected because of the availability of data that could be linked across organizations, not because they are representative of any larger area or group. Thus, the conclusions for the three States examined here may not have reflected the experiences for other States or the Nation as a whole.
- Over-counting Clients and Undercounting Expenditures per Client. Independent record-keeping systems across multiple agencies within States (contributing to the IDB) created challenges for combining information from independent systems about the same clients. While methods were carefully crafted to identify and eliminate duplicate accounting for clients in multiple programs, these methods were limited by the accuracy and amount of detail available from various data sources. There is no practical way to judge the true accuracy of these methods to identify and handle overlapping or duplicate service records. There may be some amount of over-counting of clients (records for the same individual that could not be linked accurately), and therefore, some amount of under-counting of services and expenditures per client (service records that could not be linked to clients who used those services across health care programs).

- Underestimates of Expenditures from Missing Data That Could Not Be Estimated. Prescription drug expenditures were not available for all programs; only Medicaid programs tracked medication spending. Thus, the total expenditures for non-Medicaid clients omitted this expense.
- Potential Over-counts of Expenditures from Imputation. Imputation for expenditures that are systematically missing are always fraught with potential bias. One bias that could not be avoided was the use of fee-for-service client expenditures for managed-care client expenditures. Expected lower estimates due to discounts for managed care arrangements could not be incorporated into these estimates. However, they should affect all clients in the study, preserving the validity of the relative comparisons.
- Changing Trends in Expenditures. Data from 1997 are likely to underestimate the level of current day expenditures. However, the relative cost of co-occurring illness was unlikely to change except if there were major technological changes that influenced how people with co-occurring disorders were treated relative to those with a single type of disorder.
- Missing Payer Information. These analysis did not reveal who paid the bill for clients receiving MI or SUD services, because often records did not provide payer information. Such an uncertainty would arise when services were administered by one office (the MH agency) and paid by another (Medicaid). As a result, expenditures by type of agency were not analyzed in this report.

Generally, the administrative protocols for programs within and across three States differed with regard to many things: people and services covered by the program, data collection imposed on providers, data manipulations, and the like. While SAMHSA worked closely with the three States to understand and present those differences in this report, there may still be unknown differences across the States that influenced the estimates.

**State Environments and Why Expenditures Might Vary by State**

State expenditures on clients with co-occurring MI/SUD can be expected to differ for a number of reasons. A thorough discussion of the similarities and differences of the MH/SA programs among the three States for the time period of this study is available in the first IDB report (Coffey, et al., 2001, see Table 1.2). Those are summarized below along with other reasons why expenditures might vary by State.

- Lack of uniformity in terms of State MH/SA infrastructure. In Oklahoma, one administrative structure was responsible for both MH and SA treatment for adults and children. In Delaware, responsibility was split between two organizations—one for adults and one for children. In Washington State, it was split between two agencies by type of treatment—one for MH and one for SA. Organizational structure can be expected to influence how resources are allocated to agencies and spent on clients.

- Financing arrangements, including managed care. All three Medicaid agencies used managed care and fee-for-service programs, although the extent of managed care

penetration differed. In 1996 (the year for which statistics were readily available for all three States), the percentage of the Medicaid population enrolled in managed care (capitated-payment and other non-capitated managed arrangements) was 78 percent in Delaware (HCFA, 2001), 19 percent in Oklahoma, (HCFA, 2001) and 65 percent in Washington (MAA, 1996). In Delaware, the MH/SA authorities operated and administered behavioral health care for Medicaid as a managed care program carved-out to a contractor. In Washington, SA services were carved-out from Medicaid managed care and administered by the State SA agency; for MH services, however, a network of behavioral health professionals functioned as a prepaid plan for Medicaid with the State MH agency overseeing those contracts. The differential influence of managed care can be expected to affect the types of service provided and the amount of spending.

- Clients and services covered and administrative rules. States have great autonomy in the design of their MH/SA services. They set policies about the eligibility of clients for specific programs, types and quantities of services covered per year, duration of treatments, and levels of care for specific conditions. They may attempt to control costs by capping services, such as annual inpatient days. The three States differed in these details, and those differences can be expected to have an impact on expenditures under their programs.
- Varying provider networks. In 1997, each community had a workforce of providers of MH/SA services that had evolved over time as a result of many factors, such as population centers, training programs, and public policies on MH/SA services. The existing workforce in any community affects the type and level of MH/SA resources available within that community, and, in turn, influences the intensity and types of services used. Thus, differing provider networks among the three States can be expected to influence expenditures on clients.
- Regional variation in treatment patterns. Treatment patterns vary across communities and regions of the country. These variations occur because of regional differences in professional training, popularity of new interventions, and sharing of information among local professional networks. Such variations may have affected the types and levels of resources that clients were offered across the three States.
- Total funding dedicated to services for MI/SUD treatment. Total funding allocated from all sources for MI/SUD treatment in a State influences the expenditures on clients served. States allocate different amounts of funding for MH/SA agency and Medicaid services, and they receive different proportions of Federal matching funds for Medicaid. Many MI/SUD services are optional under Medicaid. Differences among the States in total funding can be expected to influence their coverage of and expenditures on treatment services.
- Differences in prevalence. Communities may have differed in the prevalence of diseases or the disorders covered under certain programs. For example, one State may have faced a higher prevalence of heroin dependence than another State. Thus, differences in underlying client populations across the three States may have affected allocation of resources and, thus, expenditures.

- Data collection methods, including idiosyncratic local coding. At the time of this study, there were no universally applied standards for MH/SA data collection, neither for definitions, codes for data elements, nor data collection procedures. As a result, State-specific data measured concepts differently, included different types of client records and data items, and used different codes for similar concepts. While the IDB Project made these data as uniform as possible, the different State approaches to data collection can be expected to influence estimates of expenditures.

The differences among the three IDB States were viewed as so varied and fundamental that data for the three States are analyzed and presented separately in this report. Nevertheless, the focus of the analysis is not on differences across the States. The objective was to acknowledge State differences, while gleaning the similarities among them that revealed how clients with co-occurring MI&SUD disorders were treated and how much was spent on them versus other clients of the public sector. Despite the fact that the IDB represented only three States, it may be the only database that has captured a complete picture of public expenditures on such clients at the client-and-service-date-detail level.

# Chapter 3. Characteristics of Clients

This chapter addresses five questions related to client characteristics:

- What proportion of MI or SUD clients in treatment had both disorders?
- How did clients with co-occurring disorders differ demographically from clients with a single type of disorder?
- Which agencies (MH/SA or Medicaid) were supporting the treatment of clients with co-occurring disorders?
- Of clients with diagnostic data, did clients with co-occurring MI&SUD have more serious mental disorders than clients with a single type of disorder?
- How did youth with co-occurring disorders differ from adults with co-occurring disorders on the questions above? (The youth-versus-adult comparisons, noted at the end of most sections below, appear in Appendix B Tables.)

The integrated administrative data of this study was used to count the number of unique clients with co-occurring disorders State-wide in public programs. The percent of clients with co-occurring disorders was assessed in three ways: relative to the total population of these public clients, relative to those with MI, or relative to those with SUD. Table 3.1 examines the number of public clients with co-occurring disorders from all three of these perspectives. The number of unique clients treated across multiple programs for MI and/or SUD in the three States available for this study was 263,097. Of that total population of public clients, about 11 percent had co-occurring MI&SUD in this study, ranging from approximately 7 to 17 percent across the three States. The percents relative to clients with MI and relative to clients with SUD were much higher, partly because the denominator of each is smaller than the total population in treatment under public auspices.

### Co-Occurring Disorders Affect a High Proportion of Clients in Treatment for Substance-use disorders (SUD)

Thirty-six percent (or from 23 to 58 percent across the three States) of people in treatment for substance-use disorders had co-occurring mental illness during 1997, based on the IDB data. However, only 13 percent (or from 9 to 20 percent of clients across the States) of people being treated for mental illness in that year had co-occurring substance-use disorders (Table 3.1). The variation in the estimates across the States is substantial—over a 2-fold difference between the highest and lowest State, regardless of the measure. Despite that, the higher co-occurrence rate for SUD clients and lower rate for MI clients was consistent across all three States.

**Table 3.1: Percentage of clients with co-occurring disorders among three groups: those with mental illness (MI), those with substance-use disorders (SUD) and all clients in public MH/SA programs, by State, 1997**

| | Delaware | Oklahoma | Washington | Total |
|---|---|---|---|---|
| Number of clients | 18,469 | 90,322 | 154,306 | 263,087 |
| All MI clients (any MI) | 13,742 | 79,009 | 119,524 | 212,275 |
| All SUD clients (any SUD) | 7,124 | 26,917 | 45,170 | 79,211 |
| MI only clients | 11,345 | 63,405 | 109,136 | 183,886 |
| SUD only clients | 4,727 | 11,313 | 34,782 | 50,822 |
| MI&SUD clients | 2,397 | 15,604 | 10,388 | 28,389 |
| Percent of all MI clients with co-occurring SUD | 17.4% | 19.7% | 8.7% | 13.4% |
| Percent of all SUD clients with co-occurring MI | 33.6% | 58.0% | 23.0% | 35.8% |
| Percent of all clients with co-occurring MI&SUD disorders | 13.0% | 17.3% | 6.7% | 10.8% |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

## Clients in Treatment for Co-Occurring Disorders Are More Likely to be Adult, Male, and White

Of the total U.S. population through the age of 64, a majority were adults 18 to 64 years old (70 percent) (U.S. Census Bureau, 2001). Across all three States in the study, 88 percent of clients in treatment for co-occurring MI&SUD were adults; 86 percent of those in treatment for SUD only were adult (Table 3.2). Only 63 percent of clients with MI only were adult; thus, slightly more than 37 percent in that category were under the age of 18.

Gender was more evenly distributed than age across the diagnostic groups. However, a slightly higher proportion of males than in the U.S. population (U.S. Census Bureau, 2001) was treated for co-occurring MI&SUD disorders: 54 percent of clients with MI&SUD were male (Table 3.2). This was driven, in large part, by the proportion of clients with SUD only that was male—67 percent. Clients with MI only were more likely to be female—55 percent.

Members of racial/ethnic minorities (that is, people who were other than white, non-Hispanic) represented 23 percent of the total population in the three States (U.S. Census, 2003), while minority groups represented a larger proportion (31 percent) of clients with SUD only. However, minorities represented similar proportions of clients with MI only and of clients with MI&SUD as they do the combined State population— about 23 percent.

**Table 3.2: Demographic characteristics of clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), by State, 1997**

| | Number of clients | Percent youth | Percent adult | Percent male | Percent female | Percent minority | Percent white, non-Hispanic |
|---|---|---|---|---|---|---|---|
| Delaware | | | | | | | |
| MI&SUD | 2,397 | 9.2% | 90.8% | 57.1% | 42.9% | 36.0% | 64.0% |
| MI only | 11,345 | 45.7% | 54.3% | 48.2% | 51.8% | 41.7% | 58.3% |
| SUD only | 4,727 | 2.6% | 97.4% | 71.9% | 28.1% | 45.7% | 54.3% |
| Oklahoma | | | | | | | |
| MI&SUD | 15,604 | 10.9% | 89.1% | 55.2% | 44.8% | 23.5% | 76.5% |
| MI only | 63,405 | 37.1% | 62.9% | 42.9% | 57.1% | 24.4% | 75.6% |
| SUD only | 11,313 | 10.8% | 89.2% | 68.8% | 31.2% | 28.2% | 71.8% |
| Washington | | | | | | | |
| MI&SUD | 10,388 | 14.1% | 85.9% | 50.9% | 49.1% | 19.0% | 81.0% |
| MI only | 109,136 | 36.7% | 63.3% | 46.0% | 54.0% | 20.7% | 79.3% |
| SUD only | 34,782 | 16.3% | 83.7% | 64.9% | 35.1% | 30.6% | 69.4% |
| Total - Three States | | | | | | | |
| MI&SUD | 28,389 | 11.9% | 88.1% | 53.8% | 46.2% | 22.9% | 77.1% |
| MI only | 183,886 | 37.4% | 62.6% | 45.0% | 55.0% | 23.3% | 76.7% |
| SUD only | 50,822 | 13.8% | 86.2% | 66.5% | 33.5% | 31.5% | 68.5% |

Percents may not add due to small proportions of clients with missing values.
Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

Across all demographic characteristics in Table 3.2, except for minorities, the patterns were similar across diagnostic groups. When there was a higher proportion of clients with SUD only compared to clients with MI only, the age and gender groups were more likely to have a higher proportion of clients with co-occurring MI&SUD than with MI only. The higher proportion of clients with SUD only appeared to drive the higher MI&SUD proportion. This is similar to the results of Table 3.1, which showed that clients with SUD were more likely to have a co-occurring disorder than were clients with MI.

However, minority clients who had higher proportions of SUD only compared to MI only, did not appear to have higher proportions of co-occurring MI&SUD. Thus, minorities with SUD did not fit the same pattern. They were less likely to be diagnosed with co-occurring mental illness or to receive any mental health services. This pattern occurred consistently across the States. This exception to the other demographic patterns raised the question of whether minority clients with SUD disorders received comprehensive assessments, were referred for therapy for co-occurring problems, and received adequate mental health treatment. This may be an important question for other studies, but it could not be answered fully here.

## Clients with Co-Occurring Disorders Were Primarily Under the Purview of MH/SA Agencies

Clients with co-occurring disorders were more likely to be the exclusive responsibility of MH/SA agencies than to be receiving services exclusively covered by a Medicaid agency or by both entities. The proportion of all clients with co-occurring disorders found only in MH/SA agency information systems was 66 percent in the three States (Table 3.3). The proportion of all clients (adults and youth) with co-occurring disorders found only in Medicaid systems was 9 percent. The proportion found in both systems (MH and/or SA and Medicaid) was 25 percent.

The proportions of youth versus adults with co-occurring disorders found only in Medicaid systems were 19 versus 9 percent, respectively, and those proportions in both systems were 41 versus 25 percent, while those in State agency programs only were 40 versus 66 percent (Appendix B, Table B.3.3). These higher rates for youth in Medicaid and lower rates in agency programs occurred most likely because of their eligibility for Medicaid services.

**Table 3.3: Agencies tracking clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), by State, 1997**

| | Number of clients | Percent tracked or supported by MH/SA agencies only | Percent tracked or supported by Medicaid only | Percent tracked or supported by both |
|---|---|---|---|---|
| Delaware | | | | |
| MI&SUD | 2,397 | 63.0% | 22.5% | 14.4% |
| MI only | 11,345 | 31.8% | 57.4% | 10.8% |
| SUD only | 4,727 | 85.8% | 11.4% | 2.7% |
| Oklahoma | | | | |
| MI&SUD | 15,604 | 83.7% | 7.6% | 8.7% |
| MI only | 63,405 | 60.0% | 35.1% | 4.9% |
| SUD only | 11,313 | 95.7% | 4.0% | 0.2% |
| Washington | | | | |
| MI&SUD | 10,388 | 39.5% | 9.3% | 51.2% |
| MI only | 109,136 | 41.7% | 24.7% | 33.6% |
| SUD only | 34,782 | 79.7% | 9.7% | 10.6% |
| Total -- Three States | | | | |
| MI&SUD | 28,389 | 65.8% | 9.5% | 24.7% |
| MI only | 183,886 | 47.4% | 30.3% | 22.3% |
| SUD only | 50,822 | 83.8% | 8.6% | 7.6% |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

Medicaid involvement in the treatment of clients with SUD *only* was very low—about 9 percent of such clients' services were under Medicaid in the three States combined—compared with approximately 30 percent for clients with MI only (Table 3.3). This lower Medicaid coverage for SUD service receipt may have occurred for several reasons. First, SUD was more prevalent among men and adults, while Medicaid was more likely to cover children and women. Secondly, residential services in Institutions of Mental Disease are not covered benefits under Medicaid, except for certain restricted populations; children are one example. States may choose to offer or not offer other optional benefits for the treatment of substance abuse. In addition, addiction as a qualifying diagnosis for obtaining Supplemental Security Income (SSI)—a Federal program that mandated States to cover its recipients under Medicaid—was eliminated effective January 1, 1997. It was not surprising, then, that Medicaid was more likely to reimburse treatment for clients with mental illness only, rather than SUD only.

**Clients with Co-Occurring Disorders Were More Likely to Have Serious Mental Disorders**

For the purposes of this study, schizophrenia, major depression, and other psychoses were considered to be generally more serious mental conditions in comparison to stress and adjustment reactions, mood disorders, and other childhood mental disorders. In this study, clients with co-occurring disorders were more likely to have major depression and other psychoses than clients with MI only (Table 3.4). Also, in two of the three States, clients with co-occurring disorders were more likely to have schizophrenia.

Youth with co-occurring disorders also were more likely to be diagnosed with major depression and other psychoses than youth with MI only (Appendix B, Table B.3.4). Also, youth with co-occurring disorders had more stress and adjustment disorders and other childhood-related disorders than youth with MI only. Youth had a greater incidence of serious mental illness, with the exception of schizophrenia, which typically has an onset in late adolescence or early adulthood. Adults with co-occurring disorders were more likely to have schizophrenia than adults with MI only.

Table 3.4 also reflects the more limited diagnostic analyses that were possible for substance-use disorders of clients, because specific SUD diagnoses were often missing from the data. In two States high proportions of clients with SUD only (82 and 90 percent) were identified from service proxies because of missing SUD diagnoses. For the other State, where about half of the clients with SUD only were identified with diagnostic data, the clients with SUD only and those with MI&SUD were evenly split between drug and alcohol problems.

**Table 3.4: Percent of clients with specific primary diagnoses by clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), by State, 1997**

| | Delaware | | | Oklahoma | | | Washington | | |
|---|---|---|---|---|---|---|---|---|---|
| | MI & SUD | MI only | SUD only | MI & SUD | MI only | SUD only | MI & SUD | MI only | SUD only |
| Number of clients | 2,397 | 11,345 | 4,727 | 15,604 | 63,405 | 11,313 | 10,388 | 109,136 | 34,782 |
| Mental disorders | | | | | | | | | |
| Schizophrenia | 20.7% | 10.4% | 0.0% | 17.1% | 6.9% | 0.0% | 4.0% | 4.7% | 0.0% |
| Major depression | 13.5% | 9.4% | 0.0% | 15.6% | 7.7% | 0.0% | 9.9% | 4.1% | 0.0% |
| Other psychoses | 12.1% | 7.0% | 0.0% | 13.8% | 4.7% | 0.0% | 9.9% | 4.9% | 0.0% |
| Stress & adjustment reactions | 11.1% | 15.9% | 0.0% | 13.1% | 14.0% | 0.0% | 16.1% | 11.4% | 0.0% |
| Childhood attention deficit disorders (ADD) | 0.8% | 12.0% | 0.0% | 0.3% | 6.3% | 0.0% | 1.4% | 6.6% | 0.0% |
| Other childhood disorders, non-ADD | 4.8% | 15.4% | 0.0% | 4.9% | 11.1% | 0.0% | 3.1% | 5.4% | 0.0% |
| Mood disorders | 7.3% | 21.7% | 0.0% | 4.6% | 8.1% | 0.0% | 4.3% | 3.7% | 0.0% |
| Other mental disorders | 2.0% | 1.3% | 0.0% | 1.2% | 1.0% | 0.0% | 1.3% | 1.0% | 0.0% |
| Mental service, without diagnosis indicator | 15.3% | 6.8% | 0.0% | 27.4% | 40.1% | 0.0% | 47.3%[a] | 58.2%[a] | 0.0% |
| Substance use disorders | | | | | | | | | |
| Drug abuse and dependence | 30.4% | 0.0% | 11.1% | 10.6% | 0.0% | 4.7% | 27.5% | 0.0% | 21.4% |
| Alcohol abuse and dependence | 16.4% | 0.0% | 6.7% | 8.7% | 0.0% | 4.9% | 27.1% | 0.0% | 26.4% |
| Substance abuse service, without diagnosis indicator | 10.7% | 0.0% | 82.1% | 32.6% | 0.0% | 90.4% | 29.6% | 0.0% | 52.2% |

[a] A large proportion of administrative records were without diagnoses in Washington State.
Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

## Summary

***What proportion of public clients with SUD and what proportion with MI had both disorders?*** About 36 percent of clients in treatment for any SUD and about 13 percent of clients in treatment for any MI had both types of disorders in the three States' data combined in this study. The majority of these clients were identified as having both disorders between admission to care or within the 30 days following. Across the three States, the co-occurring percents for clients with any SUD varied from 23 to 58 and for any MI varied from 9 to 20. The relative direction of these results—more co-occurring illness among SUD clients than among MI clients—was somewhat consistent with the direction of results from the National Comorbidity Survey–Replication for years 2001–2003 (Kessler, 2005b).

***How did clients with co-occurring disorders differ demographically from clients with a single type of disorder?***
Clients with co-occurring disorders were more likely to be adults over the age of 18 and were more likely to be male, but were less likely to be classified as a minority, than were clients with a single type of disorder. It was not clear whether the results for minorities reflected underlying differences in the prevalence of co-occurring disorders between minorities and whites or disparities in diagnosis and treatment.

***Which programs (MH/SA or Medicaid) were treating clients with co-occurring disorders?***
Clients with co-occurring disorders were more likely to be the primary responsibility of MH/SA agencies only (66 percent) rather than the responsibility of Medicaid alone (10 percent), or both the Medicaid and MH/SA agencies (25 percent). The result for Medicaid alone was likely driven by eligibility and benefit design under Medicaid, which does not cover SUD as well as MI in some States.

***Did clients with co-occurring MI&SUD have more serious mental illness?***
Clients with co-occurring disorders were more likely to have major mental illnesses of depression, other psychoses, and schizophrenia, rather than the less severe mood or adjustment disorders.

***How did youth with co-occurring illness differ from adults with co-occurring illness?***
Compared to adults, youth with co-occurring MI&SUD were more likely under Medicaid, and were more likely to have stress and adjustment disorders and other childhood disorders than adults, who were more likely to have serious mental conditions.

# Chapter 4. Utilization of Treatment Services

This chapter addresses three main questions related to the public treatment services that were provided to clients with both mental illness and substance-use disorders (MI&SUD) compared to clients with a single type of disorder (MI only or SUD only):

- What types of services did clients with co-occurring disorders use and how many did they use compared to other clients?
    - How many inpatient days?
    - How many residential days?
    - How many outpatient services?
- How many prescription drugs were used to treat Medicaid clients, comparing those with MI&SUD to those with MI only or with SUD only? (Only Medicaid collected information on prescription drugs via reimbursement claims.)
- What types of prescription drugs were used for those Medicaid clients?

To understand the tables which follow here and in the next chapter, it is important for the reader to understand the methodological choice made by the researchers to avoid service duplication across multiple programs in the SAMHSA Integrated Database (IDB). Studying service utilization for the same clients across multiple program databases required that the same service not be counted twice in two different databases for the same client. To address the issue, shared services across the databases were identified and tagged. A consequent decision had to be made about which of the duplicate records were to be used in calculating per-person service and expenditure estimates. Upper and lower bounds of utilization and expenditures were defined based on choosing the highest or lowest annual estimates across categories of shared services. Details of the method used are described in Appendix A for analysts who may want to replicate the approach.

Tables 4.1-4.6 below and those tables in Chapter 5 with information on treatment expenditures present upper- and lower-bound estimates from shared services and also incorporate the non-shared-service amounts. The upper-bound estimates were used in calculations for deriving total service or dollar amounts so that all expenditures were included. The choice of upper or lower bounds was inconsequential because there was so little difference between the upper and lower bound estimates throughout the results.

### Types of Services Used: Clients with Co-occurring Disorders Used More Hospital Resources

Clients with both MI&SUD used more hospital inpatient services than clients with one type of disorder (Table 4.1). In this study, clients with co-occurring disorders had a much greater chance of being admitted. Clients with both MI&SUD were three to four times more likely (depending on the State) to be admitted to a hospital than clients with MI only, and they were 10 to 20 times

more likely to be admitted to a hospital than clients with SUD only. Once admitted, they did not stay as long as clients with MI only, but, in two of the three States, they did stay much longer than clients with SUD only. The shorter stays for clients with SUD only were most likely hospital stays for detoxification or crisis stabilization, rather than treatment for the substance abuse or dependence, which was often provided in outpatient settings or may not have been provided at all (Mark, et al., 2003). The shorter stays for clients with co-occurring disorders may reflect the complexity and difficulty of treating these clients. The shorter stays could reflect use of inpatient services for crisis stabilization of frequently admitted patients well known to the hospital staff or premature termination of the hospitalization. The relationship between co-occurring mental illness and substance-use disorder and premature discharge from inpatient care has been documented (Pages et al., 1998; Greenberg et al., 1994; Harper, et al., 1982).

When the total number of hospital days was averaged across all clients in each of these groups (not just those admitted), the days per client type were highest for the clients with co-occurring disorders. The averages of days per client varied threefold among the States from 5 days to 17 days (that is, averaged across all clients in each group, not just those with inpatient stays).

**Table 4.1: Inpatient utilization rates (unduplicated between Medicaid and MH/SA agencies), by State and by type of disorder for clients with any treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Number of clients | Percent of clients with any inpatient stay | Inpatient days per client for those with stays[a] | | Upper bound of total number of inpatient days | Upper bound of inpatient days per client over all clients (not just those with stays) |
|---|---|---|---|---|---|---|
| | | | Upper bound | Lower bound | | |
| Delaware | | | | | | |
| MI&SUD | 2,397 | 30.6% | 54 | 54 | 39,711 | 16.6 |
| MI only | 11,345 | 7.9% | 110 | 110 | 98,948 | 8.7 |
| SUD only | 4,727 | 3.3% | 17 | 17 | 2,626 | 0.6 |
| Oklahoma | | | | | | |
| MI&SUD | 15,604 | 22.5% | 33 | 32 | 114,709 | 7.4 |
| MI only | 63,405 | 6.8% | 38 | 38 | 164,862 | 2.6 |
| SUD only | 11,313 | 1.2% | 9 | 9 | 1,156 | 0.1 |
| Washington | | | | | | |
| MI&SUD | 10,388 | 26.5% | 21 | 19 | 56,845 | 5.5 |
| MI only | 109,136 | 6.0% | 53 | 51 | 345,486 | 3.2 |
| SUD only | 34,782 | 2.1% | 20 | 20 | 14,539 | 0.4 |

[a]Upper/lower bounds were set by choosing the maximum/minimum number of units (days, visits, or claims) that were recorded separately by the MH/SA and Medicaid agency tracking systems for client shared services (that is, when service records had identical client identifiers and types of service and had identical or overlapping dates) plus client non-shared service units (see Appendix A).

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

The upper-lower bound estimates showed that both MH/SA agency and Medicaid records gave comparable results. The similarity in both the upper and lower bound estimates is probably due to the fact that inpatient reimbursement claims are well standardized in the industry, and because Medicaid paid similar amounts as the MH/SA agency for the same type of service in these three states.

## Types of Services Used: Clients with Co-Occurring Disorders Spent More Time in Residential Treatment

Clients with both MI&SUD were as likely to be enrolled in a residential care program as were clients with SUD only, but once enrolled in residential treatment they usually stayed longer (Table 4.2). The average length of a residential stay for clients with both MI&SUD varied considerably across the States from 38 days to 102 days; the variation for clients with SUD only was from 31 to 56 days.

**Table 4.2: Residential utilization (unduplicated between Medicaid and MH/SA agencies) by State and by type of disorder for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Number of all clients | Percent of clients with any residential stay | Residential days per client for those with stays[a] | | Upper bound of total number of residential days | Upper bound of residential days per client over all clients |
|---|---|---|---|---|---|---|
| | | | Upper bound | Lower bound | | |
| Delaware | | | | | | |
| MI&SUD | 2,397 | 11.8% | 101.8 | 101.8 | 28,701 | 12.0 |
| MI only | 11,345 | 5.6% | 153.6 | 153.0 | 97,257 | 8.6 |
| SUD only | 4,727 | 12.6% | 54.8 | 54.8 | 32,683 | 6.9 |
| Oklahoma | | | | | | |
| MI&SUD | 15,604 | 24.9% | 45.5 | 45.5 | 176,977 | 11.3 |
| MI only | 63,405 | 6.6% | 39.7 | 39.7 | 167,473 | 2.6 |
| SUD only | 11,313 | 27.8% | 34.9 | 34.9 | 109,923 | 9.7 |
| Washington | | | | | | |
| MI&SUD | 10,388 | 32.0% | 38.4 | 38.1 | 127,658 | 12.3 |
| MI only[b] | 109,136 | b | b | b | b | b |
| SUD only | 34,782 | 31.6% | 30.9 | 30.8 | 339,799 | 9.8 |

[a]Upper/lower bounds were set by choosing the maximum/minimum number of units (days, visits, or claims) that were recorded separately by the MH/SA and Medicaid agency tracking systems for client shared services (that is, when service records had identical client identifiers and types of service and had identical or overlapping dates) plus client non-shared service units.
[b]The MH and Medicaid agencies in Washington did not maintain records for residential services for the study period; the SA agency in Washington did.
Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

By contrast, clients with MI only were much less likely to receive residential treatment (in the two States reporting residential services). This most likely occurred because treatment for MI was infrequently provided in a residential setting, while residential settings were commonly used for SA treatment. The length of the stay in a residential facility for those with MI only was variable—it was the longest compared to SUD only and MI&SUD in one State and in the mid-range in the other State. The third State (Washington) did not track residential services in its MH agency records, and State staff reported that when covered by Medicaid, those residential services were possibly recorded as inpatient claims. When reported in Washington State, for clients with SUD only and for clients with MI&SUD, a substantial number of residential services were provided.

When days of residential services per client were averaged across all clients in each diagnostic group (not just those with residential services), the days per client were fairly comparable across the States—about 12 days per year for clients with co-occurring diagnoses and between 7 and 10 days per year for clients with SUD only.

**Types of Services Used: Outpatient Treatment**

Four types of outpatient treatment were examined in this study: intensive outpatient treatment, methadone maintenance, case management, and routine outpatient services. An intensive outpatient treatment approach to substance abuse therapy involved a structured day, evening, or weekend treatment program that provided essential education and multiple treatment components for several hours a day, for the duration of weeks or months. For mental disorders, intensive outpatient therapy was defined as partial hospitalization.[1] For this study, intensive outpatient treatment was extracted from provider and procedure codes specific to intensive outpatient treatment in each State. Methadone services were defined from State-specific provider identifiers, procedure codes, or treatment modalities provided by each State. Case management included follow-up outreach and linkage to other social services, commonly referred to as "wrap-around services." Routine outpatient care was the remaining category, and it excluded durable medical equipment and dental care.

Any Outpatient Utilization: Clients with MI Only Were More Likely to Use Outpatient Services

Nearly all clients (81 to 99 percent) received some outpatient treatment (Table 4.3). Those with MI only were most likely to receive outpatient services (94 to 99 percent).

In contrast, in two States a substantial proportion of clients with SUD only received no outpatient services—almost 20 percent. When such a sizeable proportion of clients with substance-use disorders received no outpatient therapy, questions emerge about whether these clients were being referred appropriately for treatment, whether they were complying with follow-up care after institutional care, and/or whether barriers kept them from treatment. Other research has shown that clients with substance-use disorders have low rates of therapy in any setting following discharge

[1] While intensive outpatient visits for clients with mental disorders are frequently defined by the number of hours of treatment received in a day, this level of specificity was not available in the data and thus this approach was not feasible. The service code for partial hospitalization was used as a marker for intensive outpatient services for these clients.

from the hospital for detoxification, despite the fact that follow-on therapy has been shown to reduce subsequent relapse (Mark et al., 2003).

However, neither those studies, nor this one, reflect treatment that may have been continued in programs, like Alcoholics Anonymous, Cocaine Anonymous, and faith- or community-based support groups or other voluntary programs. And, perhaps some clients receiving residential treatment (which was highest for clients with SUD only in the two States with the lowest outpatient services) did not require outpatient follow up. Or perhaps, these clients needed additional assistance to overcome barriers and continue in treatment. Concerns about whether and what access barriers might exist to outpatient SUD services cannot be answered here and will require further research.

Intensive outpatient treatment showed no clear pattern across clients with different types of disorders, except that clients with both MI&SUD were more likely than clients with MI only to receive intensive treatment (when treatment intensity could be identified—in Delaware and Washington). Intensive outpatient treatment was used in Washington for a substantial proportion of clients with SUD only, but for a small proportion in Delaware. "Intensive outpatient treatment," designed for substance abuse treatment (TIP, 2003), can provide some clients with a less costly alternative to inpatient or residential SUD care. Perhaps different treatment practices occurred or different types of providers dominated services in these two States that influenced the provision of intensive outpatient treatment for clients with SUD.

**Table 4.3: Any outpatient utilization by State and by type of disorder for clients with any treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Number of clients | Percent with any outpatient services | Percent with any intensive outpatient services[a] | Percent with any methadone outpatient services | Percent with any case management or wrap-around services | Percent with any routine (other) outpatient services |
|---|---|---|---|---|---|---|
| Delaware | | | | | | |
| MI&SUD | 2,397 | 91.5% | 11.1% | 2.6% | 7.0% | 86.9% |
| MI only | 11,345 | 94.4% | 3.7% | 2.2% | 8.4% | 93.0% |
| SUD only | 4,727 | 95.5% | 4.6% | 11.2% | 0.0% | 89.3% |
| Oklahoma[a] | | | | | | |
| MI&SUD | 15,604 | 97.7% | a/ | 0.2% | 53.6% | 97.0% |
| MI only | 63,405 | 98.6% | a/ | 0.0% | 32.5% | 97.2% |
| SUD only | 11,313 | 83.0% | a/ | 3.4% | 11.0% | 82.4% |
| Washington | | | | | | |
| MI&SUD | 10,388 | 98.5% | 18.8% | 3.0% | 1.8% | 98.0% |
| MI only | 109,136 | 99.0% | 4.6% | 0.0% | 0.4% | 98.9% |
| SUD only | 34,782 | 81.1% | 21.4% | 5.3% | 0.9% | 61.5% |

[a]Oklahoma did not use codes that could identify intensive outpatient treatment.
Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

The other two sub-categories of outpatient services—methadone outpatient treatment and case management showed diverse treatment patterns across the three States. The lack of any discernable pattern suggests that receipt of such services may have related more to the types of providers in the State in which the client resided (and the actual availability of various types of services) than to the client's specific profile of mental illness and/or substance-use disorders. Coding differences across the States also may have contributed. As a result, no conclusions could be drawn about the impact of clients' type of disorder(s) on methadone and case management services across the States.

Outpatient Visits: Clients with Co-Occurring Disorders Had More Outpatient Visits

Clients with both MI&SUD who used outpatient services generally had more outpatient visits than clients with a single type of disorder (Table 4.4). That difference was substantial in two of the States. Thus, once treated in an outpatient setting, clients who were treated for co-occurring disorders received more measurable amounts of treatment. However, the units of total outpatient services provided varied across the three States—an average of 104, 36, and 63 visits per client per year over all clients with co-occurring disorders who had received any outpatient services (Table 4.4, last column).

As with measures of the propensity to use outpatient services (in the previous section), utilization of different types of services used by clients showed no clear treatment patterns between clients with co-occurring and a single type of disorder across the States (Table 4.4). For example, of the two States that provided intensive outpatient services, one State provided more of those visits per client for clients with co-occurring disorders, and the other provided more visits for clients with MI only.

The volume of methadone maintenance visits for clients with co-occurring disorders varied from 105 to 268 methadone visits per client per year. A high volume of visits is appropriate and expected since methadone treatment requires clients to go to the clinic to receive the methadone.

The use of outpatient case management to link clients to other needed social services and/or wrap-around services also presented a mixed picture between the three states. In Washington, of clients who received case-management services, those with both MI&SUD received a greater number of case management services (10 per client) than clients with a single type of disorder (2 and 8, respectively, per client with MI and SUD only (Table 4.4). In the other two States, clients with co-occurring illnesses received between 4 and 6 case management services per year, which was higher than clients with SUD only but similar to clients with MI only. The availability of such services was driven no doubt, by differences in the design of benefits and treatment practices across agencies and States. The extent to which these case management services were effective in linking clients with needed wrap-around services or the quantity of wrap-around services that were received are not reflected in the IDB data. Also not reflected are any case management services that were received during inpatient or residential care; thus estimates of the linkage to wrap-around services in this study are likely to be understated.

**Table 4.4: Outpatient utilization rates (unduplicated between Medicaid and MH/SA agencies) by State and by type of disorder for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Intensive outpatient visits per client with such services | | Methadone outpatient visits per client with such services | | Case management and wrap-around service records per client with such services | | Routine (other) outpatient visits per client with such services | | Upper bound of outpatient services per client with such services |
|---|---|---|---|---|---|---|---|---|---|
| | Upper bound[a] | Lower bound[a] | Upper bound[a] | Lower bound[a] | Upper bound[a] | Lower bound[a] | Upper bound[a] | Lower bound[a] | |
| | n = 15,313 | | n = 3,419 | | n = 32,284 | | n = 242,427 | | n = 251,015 |
| Delaware | | | | | | | | | |
| MI&SUD | 185.0 | 185.0 | 116.2 | 113.1 | 4.0 | 4.0 | 82.5 | 79.2 | 104.4 |
| MI only | 37.9 | 37.9 | 4.7 | 4.7 | 4.3 | 4.3 | 29.2 | 28.6 | 30.7 |
| SUD only | 130.9 | 130.9 | 250.8 | 249.0 | 1.0 | 1.0 | 35.9 | 35.6 | 69.4 |
| Oklahoma | | | | | | | | | |
| MI&SUD | b/ | b/ | 104.6 | 104.6 | 5.6 | 5.6 | 33.3 | 32.4 | 36.4 |
| MI only | b/ | b/ | 0.0 | 0.0 | 5.4 | 5.4 | 31.8 | 30.7 | 33.1 |
| SUD only | b/ | b/ | 123.2 | 123.2 | 1.8 | 1.8 | 7.1 | 7.1 | 12.2 |
| Washington | | | | | | | | | |
| MI&SUD | 33.1 | 33.1 | 268.4 | 256.6 | 10.0 | 10.0 | 49.1 | 41.2 | 63.4 |
| MI only | 42.5 | 42.5 | 0.0 | 0.0 | 2.4 | 2.4 | 19.8 | 18.0 | 21.8 |
| SUD only | 31.5 | 31.5 | 283.3 | 277.5 | 7.8 | 7.1 | 37.9 | 33.2 | 55.7 |

[a]Upper/lower bounds were set by choosing the maximum/minimum number of units (days, visits, or claims) that were recorded separately by the MH/SA and Medicaid agency tracking systems for client shared services (that is, when service records had identical client identifiers and types of service and had identical or overlapping dates) plus client non-shared service units.
[b]Oklahoma did not use codes that could identify intensive outpatient treatment.

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

Routine outpatient visits were provided in all three States. Routine outpatient visits were more often provided to clients with co-occurring disorders than to those with a single type of disorder in all States, although the magnitude of these differences varied. The large differences among the States in the number of visits per client for different services might have been related to differing coding conventions, limitations in the number of authorized visits across the States, or regional variations in practice.

The upper-lower bound estimates for outpatient services per client with such services showed more differences than they did for institutional services, but the magnitude of difference was still small.

## Medicaid Retail Psychotropic Pharmaceuticals

The review of prescription drug use was limited to Medicaid clients because only Medicaid maintained records for their clients' drug prescriptions.

As background for the context of examining prescription medications, across all States and all three diagnostic groups, between 4 percent and 68 percent of clients with MI and/or SUD received any type of service reimbursed by Medicaid (Table 4.5), and these rates differed by type of disorder. Clients with MI only or co-occurring MI&SUD were more likely to have services reimbursed by Medicaid than clients with SUD only. Between 4 percent and 20 percent of clients with SUD only received some services through Medicaid, while between 40 percent and 68 percent of clients with MI only received services through Medicaid. It is also important to note that these analyses include only retail prescriptions, not medications which may have been administered during inpatient or residential stays or through methadone clinics.

**Table 4.5: Medicaid MI/SUD retail pharmacy prescription claims by State and by type of disorder for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Number of all clients | Number of clients with any Medicaid service for MI or SUD | Percent of all clients with any Medicaid service for MI or SUD | Percent of Medicaid MI or SUD clients with any psychotropic prescriptions | Psychotropic prescriptions per Medicaid client with such claims |
|---|---|---|---|---|---|
| Delaware | | | | | |
| MI&SUD | 2,397 | 886 | 37.0% | 63.8% | 13.2 |
| MI only | 11,345 | 7,742 | 68.2% | 55.3% | 9.1 |
| SUD only | 4,727 | 669 | 14.2% | 23.0% | 5.5 |
| Oklahoma | | | | | |
| MI&SUD | 15,604 | 2,536 | 16.3% | 57.9% | 7.0 |
| MI only | 63,405 | 25,353 | 40.0% | 55.2% | 7.9 |
| SUD only | 11,313 | 482 | 4.3% | 31.3% | 5.2 |
| Washington | | | | | |
| MI&SUD | 10,388 | 6,281 | 60.5% | 60.5% | 10.5 |
| MI only | 109,136 | 63,626 | 58.3% | 53.9% | 11.4 |
| SUD only | 34,782 | 7,065 | 20.3% | 19.1% | 5.3 |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

### Clients with Co-Occurring Disorders Had about the Same Number of Psychotropic Prescription Claims as clients with MI only

A large percentage of Medicaid clients with MI or with MI&SUD received prescriptions for psychotropic medications (listed by class in Table 4.6). Between 58 and 64 percent of clients with MI&SUD had retail psychotropic prescription claims covered by Medicaid (Table 4.5). For

MI only, between 54 and 55 percent of Medicaid clients had such claims. For SUD only, between 19 and 31 percent of Medicaid clients had such claims. These lower proportions for clients with SUD relative to clients with MI may have reflected the relative scarcity of retail prescription drugs for treating SUD, compared to the abundance of medications for treating MI. Youth were much less likely than adults to be prescribed pharmacotherapy regardless of diagnosis (Appendix B, Table B.4.6).

Clients with Co-Occurring Disorders Received Medications Normally Dispensed for More Serious Mental Illness

More clients with co-occurring disorders (compared to clients with a single type of disorder) received drug therapy associated with serious mental disorders—antipsychotics normally dispensed for schizophrenia and lithium typically dispensed for bipolar manic-depressive disorder (Table 4.6). This reinforces the findings in Chapter 3 that clients with co-occurring disorders had more serious mental illnesses.

Clients with co-occurring disorders also were more likely to receive antidepressants than clients with MI or SUD alone—70 percent to 80 percent of these clients received antidepressants, compared to 50 percent to 60 percent of clients with a single type of disorder. Except for some stimulants (most likely used to treat Attention Deficit Disorder in children), utilization of prescription drugs was greater among adults than among youth (Table B.4.6, Appendix B). However, clients with MI&SUD were less likely than clients with SUD only to receive some of the prescription drugs specifically used to treat substance-use disorder (i.e., methadone, disulfiram (Antabuse®), or naltrexone).

Clients with SUD only Frequently Received Antidepressants and Anxiolytics

Table 4.6 also shows that drugs prescribed for clients with SUD only were most likely to be antidepressants and anxiolytics (benzodiazepines and others) and were much less likely to be prescriptions specific to opiate and alcohol disorders (methadone, disulfiram, and naltrexone). For clients receiving any psychotropic drugs through Medicaid, those with SUD received somewhat fewer prescriptions than those with both MI&SUD or those with MI only. The latter two groups received about the same number of prescriptions—between 7 and 13 per year, while clients with SUD only averaged about 5 per year.

The use of antidepressants by clients with SUD only was notable, especially in the absence of a diagnosis of depression or any evidence of other mental health treatment services. Over all three diagnostic groups, this class of drug was the one most frequently prescribed. While there has been a long standing interest in using antidepressants to curb the cravings for addictive substances, especially cocaine, science has not yet developed major inroads in identifying antidepressant medications that have a clinically significant effect in reducing drug craving and relapse (Nestler, 2002; Lima, et al., 2001).

**Table 4.6: Type of psychotropic drugs for Medicaid MI/SUD clients with prescriptions by State and by type of disorder for clients with any treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Delaware | | | Oklahoma | | | Washington | | |
|---|---|---|---|---|---|---|---|---|---|
| | MI & SUD | MI only | SUD only | MI & SUD | MI only | SUD only | MI & SUD | MI only | SUD only |
| Number of Medicaid MI/SUD clients with psychotropic drug prescription claims (and percent of Medicaid MI/SUD population) | 565 (64%) | 4280 (55%) | 154 (23%) | 1468 (58%) | 13986 (55%) | 151 (31%) | 3797 (60%) | 34278 (54%) | 1350 (19%) |
| Mean psychotropic prescription claims per Medicaid client with such claims | 13.2 | 9.1 | 5.5 | 7.0 | 7.9 | 5.2 | 10.5 | 11.4 | 5.3 |
| Percent of such clients with a prescription for: | | | | | | | | | |
| Antidepressants | 76.3% | 51.5% | 53.9% | 73.7% | 57.6% | 49.0% | 79.3% | 64.7% | 64.9% |
| Antipsychotics | 33.2% | 19.1% | 8.4% | 33.4% | 23.6% | 12.6% | 25.5% | 26.7% | 3.3% |
| Barbiturates | 2.1% | 0.8% | 5.8% | 1.2% | 1.7% | 5.3% | 0.0% | 0.9% | 3.0% |
| Benzodiazepines | 41.1% | 25.9% | 41.6% | 31.5% | 21.7% | 41.7% | 37.7% | 27.2% | 37.3% |
| Lithium | 6.7% | 3.4% | 0.7% | 5.9% | 3.2% | 2.0% | 10.1% | 8.2% | 1.5% |
| Other anxiolytics/ sedatives/hypnotics | 32.2% | 21.3% | 31.2% | 24.9% | 18.8% | 19.9% | 30.2% | 18.4% | 28.5% |
| Stimulants | 7.4% | 39.9% | 0.0% | 6.8% | 31.4% | 0.0% | 4.7% | 18.1% | 2.4% |
| Methadone | 0.2% | 0.2% | 0.7% | 0.4% | 0.1% | 0.7% | 1.9% | 0.5% | 3.0% |
| Antabuse | 0.5% | 0.1% | 2.0% | 0.3% | 0.0% | 0.0% | 2.9% | 0.3% | 3.4% |
| Naltrexone | 3.7% | 0.1% | 5.2% | 1.0% | 0.1% | 3.3% | 1.1% | 0.1% | 1.6% |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

A significant portion of clients with SUD only and clients with MI&SUD were also receiving prescriptions for benzodiazepines and other anxiolytics. While some of these medications may be used in detoxification, medications for detoxification of clients with SUD are largely administered in hospitals, outpatient departments, and public clinics, rather than through retail pharmacies (the data source for these analyses). The indications for use of anxiolytics with these populations are unclear. Brunette and others (2003) have noted the increased risk for clients with co-occurring MI&SUD of developing benzodiazepine abuse and suggest that physicians should consider other treatments for anxiety disorders for this group of patients. Posternak and Mueller (2001) argue that benzodiazepines can be appropriately used in the treatment of patients with anxiety disorders who also have a history of substance abuse or dependence.

The sizeable proportion of SUD only patients who received benzodiazepine prescriptions in the absence of any other diagnosis is of some concern and may represent successful drug seeking behavior on the part of clients. Other more finely grained studies are needed to understand how these medications are being used with clients with SUD only and MI&SUD and to what effect.

**Summary**

In general, clients with co-occurring disorders received more care than clients with a single type of disorder.

***Did clients with co-occurring disorders use more inpatient and residential services?***

Yes, they received more hospital inpatient treatment than clients with a single type of disorder, because they were more likely to be admitted to the hospital. Once admitted, however, they did not stay as long, on average, as clients with mental illness only.

Clients with co-occurring disorders also spent more time in residential treatment than clients with a single type of disorder. They were admitted to residential care as frequently as clients with SUD only (which was significantly more frequent than clients with MI only), and they stayed longer in residential care.

***Did clients with co-occurring disorders use more outpatient services?***

Nearly all clients received some outpatient treatment. The number of outpatient services used by clients with co-occurring disorders was generally higher than clients with a single type of disorder.

***Were clients with co-occurring disorders prescribed more medications?***

Clients with co-occurring disorders were slightly more likely to be prescribed psychotropic medications used for treatment of serious mental disorders (e.g., schizophrenia and bipolar manic-depressive disorders) than were clients with MI only. This finding suggested that clients with co-occurring disorders were more likely to have serious mental conditions. Those with co-occurring disorders receiving psychotropic prescriptions received about the same number of prescriptions as clients with MI only receiving these prescriptions.

However, relative to clients with SUD only, clients with co-occurring disorders were less likely to receive medications used to treat substance-use disorders. Moreover, a very small (0 to 5) percent of all clients with SUD (co-occurring or a single type of disorder) received medication specific to the treatment of a substance-use disorder.

It is noteworthy that clients with SUD only received antidepressants as readily as clients with MI only. Also, the use of benzodiazepines with clients with SUD only was a concern. This study could not determine whether treatment with antidepressants or benzodiazepines for clients with SUD occurred before, during, or after treatment for substance-use disorders.

# Chapter 5. Expenditures on Treatment

This chapter presents estimates to answer questions about the expenditures for treating clients with co-occurring mental illness and substance-use disorders (MI&SUD) in public programs in three States in 1997, compared to treating clients with one type of those disorders:

- Did the treatment in public programs of clients with both MI&SUD, in comparison to the treatment of those clients with a single type of diagnosis, require the same amount of expenditures?
- What were the relative expenditures for treatment services for:
    - All services combined?
    - Inpatient and residential services?
    - Outpatient care?
- For Medicaid clients, what were the expenditures for prescribed medications for those with co-occurring MI&SUD compared to others with only mental illness (MI only) or only substance-use disorders (SUD only)? (Among the public programs studied here, only Medicaid collected information on prescription medications.)

Dollar estimates in tables in this chapter include two types: 1) the total of State dollars in a calendar year expended on treatment and 2) the average State expenditure per client per year. The former provides States with a view of the total dollars they incurred for treatment of MI and/or SUD in 1997 across three programs combined—mental health (MH) agencies, substance abuse (SA) agencies, and Medicaid agencies. The latter provides estimates, again combined across those programs, of the expenditure *per client* in 1997 so that comparisons could be made across types of clients and types of services.

Although the tables provide both types of estimates, the discussions below focus on the expenditure per client. Since service-level dollars were imputed for clients with missing expenditure amounts (even if the client was under managed care and capitation payments), capitation payments were excluded to avoid double counting.

As noted at the beginning of Chapter 4, upper and lower bounds were defined to handle overlapping and duplicate accounting across different information systems for the same person. Detailed information on this and other methods issues are in Appendix A.

**Services Overall: Expenditures per Client with Co-Occurring MI&SUD Disorders Were Greater Than Expenditures per Client with Single Disorders**

Clients with both MI&SUD incurred total expenditures almost double that of clients with MI only and about four times that of clients with SUD only (Table 5.1).

Another way to assess the expenditures for co-occurring disorders was to determine the total expenditures for clients with MI only *plus* expenditures for clients with SUD only and compare it

with expenditures for clients with both MI&SUD. If the treatments were simply sequential and additive, the sum of expenditures for each single type of disorder, added together, should approximate the total for expenditures for clients with co-occurring disorders. That was not the case. The per-person expenditures for the treatment of co-occurring disorders were greater than the sum of the per-person expenditures for clients with a single type of disorder—21 to 36 percent greater across the States. For example, for Washington in Table 5.1, the expenditure of $5,691 per client with co-occurring disorders for any MI and/or SUD care was 21 percent higher than the sum of the expenditures on clients with single diagnoses (i.e., $5,691 / ($3,207 + $1,483) = 1.21). This implies an intensity of services for those with MI&SUD that was greater than for the sum of the individual disorders. Across the States, this differential was much more pronounced for youth than adults. For youth, the cost of co-occurring disorders was 56 to 90 percent higher than the expenditures for a young client with a single type of disorder; for adults, it was 9 to 35 percent higher (calculated from Appendix B, Table B.5.1).

**Table 5.1: Total expenditures (unduplicated between Medicaid and MH/SA agencies) by State and by type of disorder for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | | Total State spending (excluding BH capitation) | | Total spending per client (excluding BH capitation) | |
|---|---|---|---|---|---|
| | Total clients | Upper bound[a] | Lower bound[a] | Upper bound[a] | Lower bound[a] |
| Delaware | | | | | |
| MI&SUD | 2,397 | $26,011,080 | $25,758,922 | $10,852 | $10,746 |
| MI only | 11,345 | $66,396,918 | $66,019,175 | $5,853 | $5,819 |
| SUD only | 4,727 | $12,633,650 | $12,595,164 | $2,673 | $2,665 |
| Oklahoma | | | | | |
| MI&SUD | 15,604 | $83,902,053 | $82,876,528 | $5,377 | $5,311 |
| MI only | 63,405 | $162,508,141 | $160,391,563 | $2,563 | $2,530 |
| SUD only | 11,313 | $15,768,580 | $15,763,259 | $1,394 | $1,393 |
| Washington | | | | | |
| MI&SUD | 10,388 | $59,122,240 | $55,901,429 | $5,691 | $5,381 |
| MI only[b] | 109,136 | $350,019,998 | $337,745,164 | $3,207 | $3,095 |
| SUD only | 34,782 | $51,572,416 | $50,630,490 | $1,483 | $1,456 |

[a]Upper/lower bounds were set by choosing the maximum/minimum number of units (days, visits, or claims) that were recorded separately by the MH/SA and Medicaid agency tracking systems for client shared services (that is, when service records had identical client identifiers and types of service and had identical or overlapping dates) plus client non-shared service units.
[b]Washington expenditures for clients with MI only were understated because Washington records did not include spending on residential services for those clients.
Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

## Expenditures for Inpatient Services

Spending per Client in Inpatient Treatment Was Greatest for Clients with MI Only, Followed by Clients with Co-Occurring Disorders

For the subset of clients receiving inpatient services, clients with MI only were the most costly on a per-client-receiving-inpatient-services basis, with expenditures, on average, of approximately $9,000 to $35,000 per year (Table 5.2). Clients with co-occurring MI&SUD disorders ranked second in these expenditures ($7,000 to $17,000) and clients with SUD only ranked third ($3,000 to $7,000). This ranking in expenditures—MI only, MI&SUD, SUD only—follows the ranking in numbers of days in the hospital spent by these different types of clients (see Table 4.1). We can only speculate on the reasons that clients with co-occurring disorders had lower inpatient expenditures than clients with MI only. They might have had long stays for psychiatric care and short stays for substance-use treatment, which averaged out to expenditures between that of the two types of single conditions. Or, they may have a more difficult time completing their inpatient treatment, leaving against medical advice or being transferred because of behavior.

The ranking order changed when expenditures for inpatient services were averaged across all clients (not just those in inpatient treatment during the year). Then, clients with co-occurring MI&SUD had the highest inpatient treatment expenditures compared to clients with a single diagnosis. The fact that clients with co-occurring disorders as a group were much more likely to be admitted to the hospital for treatment than clients with a single diagnosis accounted for this.

Spending per Client in Residential Care Was Lowest for Clients with SUD Only

For the two States that maintained records on residential care services, expenditures per client using residential services were substantially less for clients with SUD only, than for the other two groups. The lower cost for residents with SUD alone reflected the fact that residential services, which typically were more costly for youth than adults (Appendix B, Table B.5.2–5.4), were much less likely to be used for youth given the low proportion of clients with SUD only who are young (Table B.5.1). Expenditures per client for residential services showed no clear pattern between clients with co-occurring disorders and with MI only; one State spent more on residential care for persons with co-occurring disorders than with MI only and one spent less.

However, when averaged across all clients in the diagnostic subgroup (not just those who used residential services), clients with co-occurring disorders had higher expenditures for residential treatment than the single-diagnosis groups of clients. These higher expenditures for clients with co-occurring disorders reflected the fact that they were more likely to receive residential treatment.

**Table 5.2: Institutional expenditures (unduplicated, upper bound[a] between Medicaid and MH/SA agencies) by State and by type of disorder for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Inpatient services | | | Residential services[b] | | |
|---|---|---|---|---|---|---|
| | Total spending | Spending per client with such services | Spending per client over all clients | Total spending | Spending per client with such services | Spending per client over all clients |
| Delaware | | | | | | |
| MI&SUD | $12,162,131 | $16,570 | $5,074 | $3,361,399 | $11,920 | $1,402 |
| MI only | $31,801,391 | $35,453 | $2,803 | $9,847,864 | $15,557 | $868 |
| SUD only | $789,800 | $5,129 | $167 | $3,324,226 | $5,578 | $703 |
| Oklahoma | | | | | | |
| MI&SUD | $25,302,399 | $7,194 | $1,622 | $14,514,415 | $3,728 | $930 |
| MI only | $38,851,637 | $8,987 | $613 | $13,819,468 | $3,278 | $218 |
| SUD only | $372,559 | $2,801 | $33 | $7,575,256 | $2,406 | $670 |
| Washington | | | | | | |
| MI&SUD | $20,946,568 | $7,598 | $2,016 | $8,214,445 | $2,470 | $791 |
| MI only | $119,037,888 | $18,235 | $1,091 | b | b | b |
| SUD only | $5,149,754 | $7,213 | $148 | $19,815,557 | $1,804 | $570 |

[a] Upper/lower bounds were set by choosing the maximum/minimum number of units (days, visits, or claims) that were recorded separately by the MH/SA and Medicaid agency tracking systems for client shared services (that is, when service records had identical client identifiers and types of service and had identical or overlapping dates) plus client non-shared service units.
[b] The MH and Medicaid agencies in Washington did not maintain records for residential services; the SA agency in Washington did.
Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

## Expenditures for Outpatient Care

Outpatient Expenditures: Clients with Co-Occurring Illnesses Had the Highest Expenditures for Outpatient Care

Clients with co-occurring disorders had higher expenditures per client for outpatient care regardless of which clients were used as the base (clients using outpatient services or all clients using any service). Using clients with outpatient services as the base, expenditures for clients with co-occurring disorders were between 40 to over 100 percent greater (depending on the State) than those of clients with MI only and between 145 to about 245 percent higher than those of clients with SUD only (calculated from Table 5.3, middle column). Using clients with any service as the base, expenditures for clients with co-occurring disorders were between 40 to over 100 percent greater than those of clients with MI only and between 134 to about 300 percent higher than those of clients with SUD only (calculated from Table 5.3, last column). The higher outpatient expenditures for clients with co-occurring illnesses at least partly reflected a larger number of outpatient visits per client with MI&SUD than with MI only or SUD only (Table 4.1).

**Table 5.3: Outpatient expenditures (unduplicated, upper bound[a] between Medicaid and MH/SA agencies) by State and by type of disorder for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Outpatient services | | |
|---|---|---|---|
| | Total spending | Spending per client with such service | Spending per client over all clients |
| Delaware | | | |
| MI&SUD | $10,096,510 | $4,604 | $4,212 |
| MI only | $22,832,812 | $2,133 | $2,013 |
| SUD only | $8,479,733 | $1,879 | $1,794 |
| Oklahoma | | | |
| MI&SUD | $43,509,124 | $2,853 | $2,788 |
| MI only | $104,266,949 | $1,668 | $1,644 |
| SUD only | $7,790,072 | $829 | $689 |
| Washington | | | |
| MI&SUD | $28,135,524 | $2,748 | $2,708 |
| MI only | $209,128,213 | $1,936 | $1,916 |
| SUD only | $26,343,495 | $934 | $757 |

[a]Upper/lower bounds were set by choosing the maximum/minimum number of units (days, visits, or claims) that were recorded separately by the MH/SA and Medicaid agency tracking systems for client shared services (that is, when service records had identical client identifiers and types of service and had identical or overlapping dates) plus client non-shared service units.
Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

Retail Prescription Drug Expenditures for Medicaid Clients: Clients with MI Only and with Co-Occurring Disorders Had Higher Psychotropic Medication Expenditures than Those with SUD Only

Based on Medicaid records, the ranking of retail expenditures for psychotropic medications for Medicaid clients with co-occurring disorders versus Medicaid clients with MI only were mixed—much lower in one State, more comparable but slightly lower in another, and much higher in the third (Table 5.4). However, compared to medication expenditures for Medicaid clients with SUD only, those with co-occurring MI&SUD had much higher pharmaceutical expenses—two to three times higher.

By comparing the per-client prescription expenditure with the per-client average number of prescriptions from information in Chapter 4, the average expenditure per prescription could be estimated. The average per-prescription expenditure was similar for clients with co-occurring disorders and those with MI only, at least in two States—about $50 per person per prescription.

However, that price ($50) was much higher than the average expenditure for clients with SUD only—which was about $35 per prescription.

**Table 5.4: Retail prescription psychotropic medication expenditures (Medicaid clients only) by State and by type of disorder for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Retail prescription drugs based on Medicaid records | |
|---|---|---|
| | Total spending | Spending per Medicaid client with such service |
| Delaware | | |
| MI&SUD | $391,040 | $630 |
| MI only | $1,914,850 | $439 |
| SUD only | $39,890 | $195 |
| Oklahoma | | |
| MI&SUD | $576,115 | $369 |
| MI only | $5,570,086 | $392 |
| SUD only | $30,693 | $171 |
| Washington | | |
| MI&SUD | $1,825,704 | $464 |
| MI only | $21,853,896 | $627 |
| SUD only | $263,610 | $127 |

[a]Upper/lower bounds were set by choosing the maximum/minimum number of units (days, visits, or claims) that were recorded separately by the MH/SA and Medicaid agency tracking systems for client shared services (that is, when service records had identical client identifiers and types of service and had identical or overlapping dates) plus client non-shared service units.
Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

## Summary

This study answered a number of questions about expenditures for services for clients with both mental illness and substance-use disorders (MI&SUD) treated in public programs within three States, compared to clients in the same programs who have only mental illness (MI only) or only substance-use disorders (SUD only):

### *Was the public program treatment of clients with MI&SUD more costly than the treatment of clients with a single type of diagnoses?*

Yes. Expenditures for clients with co-occurring disorders incurred expenditures per client that were almost double those of clients with MI only and that were about four times more than clients with SUD only. The expenditure per client with co-occurring disorders varied across the States from $5,000 to $11,000. Clients with co-occurring disorders had total expenditures

greater than the combined average expenditures of clients with mental illness only and clients with SUD only.

***What were the expenditures related to inpatient services for clients with co-occurring disorders and how did these compare to others with MI only or SUD only?***

Examining only clients who used inpatient care, clients with co-occurring disorders incurred inpatient expenditures that were less than for clients with MI only and more than for clients with SUD only. While clients with co-occurring disorders incurred expenditures ranging from $7,000 to $17,000 (across the States) per client for inpatient services, clients with MI only incurred expenditures ranging from $9,000 to $35,000, and clients with SUD only incurred expenditures ranging from $3,000 to $7,000. These estimates were averaged over the subset of clients who received inpatient services, not all clients. Thus, for persons who received inpatient care, clients with MI only were the most expensive for State programs, in terms of expenditures on inpatient care.

However, clients with MI only were less likely to be admitted to the hospital than clients with co-occurring disorders. If all clients of each group were considered (those with and without inpatient care), average expenditures for clients with co-occurring disorders was greater, since they were more likely to be admitted to an inpatient treatment facility than clients who had a single type of disorder.

***What were the expenditures related to residential services for clients with co-occurring disorders and how did these compare to others with MI only or SUD only?***

For residential services, there were fewer differences among the three diagnostic groups. Because clients with MI&SUD were more likely to be admitted to residential treatment, their expenditures per person as a group (over those with and without residential stays) were higher.

***What were the expenditures related to outpatient care for clients with co-occurring disorders and how did these compare to others with MI only or SUD only?***

Clients with co-occurring disorders had higher total outpatient expenditures. Those per person expenditures were 40 to over 100 percent higher (across the States) than those for clients with MI only and 145 to about 245 percent higher than those for clients with SUD only. The average amount spent for outpatient treatment was $2,700 to $4,600 per client with co-occurring disorders.

***For Medicaid clients, what were the expenditures for prescribed medications for clients with MI&SUD and how did these compare to others with MI only or SUD only?***

Among the public programs studied here, only Medicaid collected information on retail prescription medications, so this comparison was limited to clients with Medicaid coverage. For Medicaid clients who received prescription medication(s), those expenditures for clients with co-occurring disorders was about $400 to $600 per person per year. The range of per person expenditures for clients with MI only was the same—$400 to $600 (but this was not necessarily

observed for the same States). The spending range for clients with SUD only was $100 to $200, although few clients with SUD only received prescription medication(s).

***Were the expenditures similar for youth and adults?***

The total expenditures per youth with co-occurring disorders were higher than adults with both conditions in two State (20 percent higher) and similar in the third. However, the spending per youth versus adult for MI only and SUD only was generally lower.

# Chapter 6. Discussion and Policy Implications

This study is one of the very few across-program studies on the major payers of mental health and substance abuse treatment services for people with co-occurring mental illness and substance-use disorders (MI&SUD). The study was made possible by a SAMHSA collaboration with three States—Delaware, Oklahoma, and Washington State—to integrate data from three types of public programs—mental health, substance abuse, and Medicaid programs.

This study examined clients of these public programs during 1997 and compared clients with MI&SUD versus those who had mental illness only (MI only) and those who had substance-use disorders only (SUD only). These clients were compared on the basis of demographics, utilization of treatment services, and expenditures.

This chapter discusses the implications of findings from prior chapters. Since only data about clients who were up to 64 years of age and in treatment for MI&SUD during the study year were included, the implications may not apply to clients older than 64 or those not in treatment. To the extent that the care systems now in place may have changed since 1997, these implications may not now apply to current State systems of care for MI and SUD. However, the results may suggest some important areas for quality assessment and improvement of public treatment programs for clients with co-occurring disorders.

### What was the prevalence of the population with co-occurring MI&SUD, and what did this imply about State programs?

**Prevalence.** Prevalence of the population with MI&SUD varied greatly by reference group. The prevalence of MI&SUD was small but not insignificant *among all clients* in this study—11 percent of all clients in MI and/or SUD treatment for the three States combined had co-occurring MI&SUD. *Among clients with MI*, it was also relatively small—13 percent. However, *among clients with SUD*, it was quite large—36 percent for the three States combined and as much as 60 percent in one State. The direction (although not the magnitude) of these findings are consistent with the results of a special analysis of the National Comorbidity Survey Replication (NCS-R) which found that 60 percent of household members with SUD also had MI and that only 9 percent of household members with MI also had SUD (Kessler, 2005a). Though the prevalence for MI&SUD co-morbidity were less than that identified in the NCS-R, it falls within the range cited for co-morbidity of substance abuse with two types of mental disorders for clients *in treatment* found in the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) (Grant et al., 2004).

**Differences in Reporting of Co-occurring MI among Clients with SUD.** The differences in the prevalence estimates between the household surveys (NCS-R and NESARC) and the current study could be viewed as under reporting in administrative data, particularly of MI among clients with SUD. The overall prevalence rate for co-occurring MI among clients treated for SUD in the current study falls at the lower end of the NESARC estimate for clients in treatment; it was also much smaller than NCS-R estimates—36 versus 60 percent, respectively—suggesting that some

substance abuse providers may not have screened for MI or may not have reported such problems on administrative records.[2]

The workforce in substance abuse treatment facilities has been characterized as predominantly counselors with few other professional disciplines represented (McLellan et al., 2003). In the face of the complexities already noted regarding the identification of co-occurring disorders, such workforce issues may have a significant impact on prevalence estimates for co-occurring MI&SUD in a treated population, such as that in this study. In addition, some substance abuse treatment providers may have believed that the client's "mental illness" had been induced by the substance use and would remit if the SUD was addressed; such a belief is supported by the findings of Verheul and others (2000). With such a belief, clinicians may not have recorded diagnoses related to mental illness.

Alternatively, given the large proportion of clients who were identified and recorded as having co-occurring MI&SUD on the same day, attention also needs to be paid to the question of whether the diagnostic criteria for substance-induced mental disorders were appropriately applied. This would serve to inflate the estimates of the prevalence of co-occurring disorders in this study. One State administrator suggested that the estimates of co-occurrence were inflated and represented early attempts at help-seeking for clients with substance-use disorders when they were still in denial about their substance use. Only more focused studies related to actual diagnostic practices and specific client episodes over time can provide answers to some of these questions.

This study's overall prevalence rate for co-occurring SUD among clients treated for MI was slightly higher than the NCS-R household survey—13 versus 9 percent, respectively. Again, the differences in the household sample and this study's treated sample and the varying diagnostic scopes may explain some of this difference. Of particular note is that persons with schizophrenia and other non-affective disorders were excluded from data collection for the NCS-R (Kessler, 2005b). The current study, however, found that people with schizophrenia were more likely than people with other mental disorders to have co-occurring SUD, and this finding may explain all or part of the 13-percent-versus-9-percent discrepancy. In addition, clients in public treatment settings that serve a much higher proportion of individuals with serious mental illness should have had higher prevalence of co-occurring SUD than household populations. It may also be that people were willing to acknowledge substance-use problems in an anonymous survey, but they did not want it documented in claims for insurance reimbursement. Some mental health providers also may have believed that the substance-use problem was secondary to the mental illness that it would remit if the mental illness was treated and thus no data related to substance-use disorders were entered.

It is important to note that there were significant differences between the populations and methods used in this study versus either national study. The disparate results may only reflect the inherent differences between the household sample of persons 18 years of age and above in

[2] There may have been many reasons for not reporting such problems—not recognizing the MI, not being certified to receive payment for MI assessment and documentation, not being paid to follow up with clients referred to MI to guarantee treatment, and using caution to classify a client who just meets the diagnostic criteria for MI when the classification may cause the client to be further stigmatized.

the two national studies by Grant et al. and Kessler et al., and this study which involved all ages up to 65 years in treatment for a mental or substance-use disorder in three States. This study included all persons who received a mental health treatment during a calendar year, while the national prevalence studies focused on specific types of co-morbidities, excluding schizophrenia and other non-affective psychoses. Given the many differences between the populations, methods, and definitions used in this study and the national surveys, comparison of results is of limited value.

**The results of this study add one more answer to the question: How prevalent are co-occurring mental illness and substance-use disorder**? While no estimate is free from bias, multiple estimates from varying populations, using varied methods, may one day lead to clearer and more accurate counts. The development of some consensus about reporting and specific data elements would help States better measure and understand the actual prevalence of these co-occurring disorders and better plan services to meet these clients' needs. In particular, since these estimates are drawn from clients in treatment in the public sector, they are likely to be relevant to similar public programs.

**Did characteristics of clients with co-occurring illnesses differ from clients with a single type of disorder, and was there clear evidence of racial disparity in identification and treatment?**

**Age, Gender, and Clinical Severity.** Clients with co-occurring MI&SUD in the public programs studied here were more likely to be adult than youth and more likely to be male than female. They also were more likely to have serious mental illnesses, such as major depression, schizophrenia, and other psychoses, rather than the generally less severe mood or adjustment disorders. This did not mean that the less severe groups had no co-occurring illness, but rather indicated which clients should receive the highest priority for screening for a co-occurring disorder.

**Racial/Ethnic Disparities.** In this study, clients with co-occurring disorders were more likely to be white (non-Hispanic) than minority, compared to clients with single diagnoses. Moreover, the data suggest that when clients with SUD only were more prominent in a demographic subgroup than clients with MI only, then the MI&SUD rates were likely to be higher for that subpopulation. However, minorities were the lone exception to this pattern across all the States. Records of minorities were less likely to include co-occurring mental illness, even though they had higher SUD-only rates than MI-only rates. This exception to the other demographic patterns raised the question of whether minorities with SUD disorders were less likely to receive comprehensive assessments of mental as well as substance-use disorders. Further, it highlighted concerns that minorities may have been referred less often for treatment of co-occurring disorders, including for psychiatric therapy.

The question of whether these findings are the result of racial or ethnic disparities in the provision of care was not answered in this study. Nevertheless, it remains an important issue for State agencies to unravel. Disparities in treatment of physical diseases for racial/ethnic minorities have been widely documented (IOM, 2003). One landmark analysis of physicians'

willingness to recommend cardiac treatment documented discrimination against minorities in physician orders for high-technology treatments (Schulman et al., 1999). Thus, it would not be surprising to find uneven treatment of minorities compared to whites in diagnosis of and referral for the treatment of mental and substance-use disorders. Further, the fact that identification of co-occurring conditions requires an accurate assessment of both mental illness and substance-use disorder implies that bias in diagnosing either condition may lead to under-reporting of co-occurring conditions. Alternatively, underlying differences in the prevalence of disease or other factors, such as the person's propensity to seek treatment, may cause differences in observed rates of co-occurring MI&SUD in the treated population between minority groups and whites.

One study of the prevalence of MI&SUD co-occurrence among 425 adults in treatment for cocaine dependence found that the same proportion of African American males as Caucasian males (73 percent) had mental illness. A lower percent of African American women in the study (61 percent) than Caucasian women (83 percent) were diagnosed with a mental disorder (Compton et al., 2000a and 2000b). Other studies also have documented racial disparities in mental health care, especially in the diagnosis of depression or anxiety (Wang et al., 2000; Young et al., 2001).

While the results from this study are suggestive of a negative bias towards diagnosing minorities with mental illness, further research is needed to assess the possibility of racial/ethnic disparities in behavioral health programs. Potential racial disparities in assessment of co-occurring illness cannot be addressed with administrative records alone. Household surveys and possibly double-blind studies of professional attitudes, similar to the cardiac treatment study by Schulman and colleagues (1999), will be necessary.

**What was learned about the coverage of co-occurring MI&SUD treatment across different public agencies, and what were the implications about coordination among the programs?**

Clients with co-occurring disorders were more likely to be the exclusive responsibility of MH/SA agencies only (66 percent), rather than Medicaid alone (10 percent) or both (25 percent). Another study discovered that clients with co-occurring disorders under State agency programs alone (compared to Medicaid or both programs) had the longest regimens of treatment (Bray et al., 2005). That study could not evaluate whether those longer regimens resulted in better outcomes for individuals or a decrease in the known consequences of untreated or under-treated co-occurring MI&SUD, including stress, crime, and incarceration. Further research is needed to understand the implications of different sponsors and programs related to care for MI&SUD. Such research would help guide State decisions about how to best organize, manage, and coordinate treatment of clients with co-occurring MI&SUD. For efficient use of State resources, care coordination at the client level is clearly imperative for the 25% of clients who receive services under the auspices of both the State MH/SA agencies and Medicaid.

**What were the implications for public policy that emerged from the higher expenditures for clients with co-occurring MI&SUD?**

**Costly co-occurring disorders.** Clients with co-occurring disorders used more resources per person than clients with single diagnoses. Over the three States studied, 11 percent of the clients—those with both MI&SUD—received 20 percent of the total resources spent by these State MH/SA programs. Thus, from a State perspective, substantial returns on investment might be possible by improving the design of programs targeted to clients with co-occurring MI&SUD so that they received better coordinated care and follow up. Research, especially about model systems and costs as well as practical guidelines, is needed for several purposes—to improve the identification of clients' MI and SUD co-morbidities; to educate providers on evidence-based, cost-effective treatment methods (CSAT, 2005); to delineate best practices in service design, delivery, and reimbursement; to assure sufficient access to services and case management of those services; and to measure the outcomes of treatment approaches. Considering that those clients with co-occurring conditions demonstrated more use of the most costly services (inpatient and residential care) significant savings could result if systems of care are designed and implemented that maximize the appropriate use of ongoing outpatient and recovery programs with the well-managed use of inpatient and residential care.

The SAMHSA 2002 Report to Congress on the prevention and treatment of co-occurring disorders included a five-year plan to address the problem of co-occurrence of mental and substance-use disorders. The report advised service delivery organizations, facilitated primarily by State and local governments, to create a system and programs with "no wrong door" for clients with mental illness (MI) and/or substance-use disorders (SUD).

**Severity of Illness and Expenses for Adults and Youth.** The finding of proportionately higher expenses for clients with MI&SUD was consistent with the complexity and severity of their problems and with their patterns of more utilization of costlier services (inpatient and residential care). Inference of greater disease severity for adults with MI&SUD was supported by the prescription drug therapies generally prescribed for those with more severe mental illnesses.

Youth with co-occurring disorders were relatively more expensive than adults. Multiple factors may be responsible for these high expenditures. It is possible that differences in costs between youth and adults may simply reflect differences in evidence-based clinical treatment practices because of the age and developmental needs of young clients. This study did not address such clinical issues; further research with different data sources would be needed to address such questions. Alternatively, since youth were much more likely to be eligible for Medicaid than were adults, that eligibility might have encouraged more expansive treatment of youth. On the other hand, the higher expenditures for treatment services for youth compared to adults appeared in different settings, possibly reflecting different treatment patterns between the States. One State spent more on residential treatment for youth. Another State spent dramatically more on inpatient treatment for youth. A third State balanced spending between youth and adults (although their data system probably did not include all residential treatment services).

**Summary**

The results of this study suggest that the identification, financing, and treatment of people with co-occurring disorders were highly variable. Greater utilization of, and expenditures for, services for those with co-occurring disorders were found. Expenditures for co-occurring MI&SUD were more than the sum of the cost of care for MI only and SUD only, highlighting the complexity of treating co-occurring conditions compared with that of treating two separate singular conditions.

The results also documented that State MH and SA agencies were, at least for the majority of adults with co-occurring disorders, the most important source of funding for treatment, not Medicaid. Thus, State MH and SA authorities have it largely within their power to change the systems of care that have evolved over time, so that the quality of care for persons with co-occurring disorders improves.

This study also raised important issues relevant to serving clients; in particular, questions concerning how to provide quality care and how to standardize and finance that care. These issues require data with greater clinical specificity than that available through the IDB administrative data. Nonetheless, this study was unique in providing cost and utilization data across the major payers of mental health services and substance-use treatment for three States.

# Chapter 7. State Differences and Integrated Data Systems

## State Differences

While State differences were specifically not a focus of this study, the variation in utilization and expenditures across the States invited the question: Why did these differences exist? There were numerous reasons for the observed differences across the States, in addition to the data and methodological issues already raised.

- The three States had different organizational and administrative infrastructures and information collection processes. This study found State differences in the types of services recorded, in coding practices for diagnostic and treatment detail, and in reporting requirements for reimbursement. These differences in data reporting also varied across agencies within the States. For example, the estimate of MH/SA spending in Washington was incomplete because they did not capture residential treatment services related to MH and Medicaid payments for clients eligible for treatment in Institutions of Mental Disease within their data collection system. These differences indicated that comparisons across States of total costs per client could have varied a great deal if some component of spending was missing.

- There were differences in the prevalence of disorders and availability of treatment across the States. One study estimated the gap (public and private) by State in treatment and the need for treatment of people with alcohol and drug abuse disorders from substance-abuse-related accident and arrest records (McAuliffe et al., 2003). On a scale that measured the relative adequacy of treatment (local resources) relative to the need for treatment (as noted above), States were ranked from -32 to +33. The three States in this study ranged from the mid-range of -7 to near the top at +30, representing the number of clients receiving treatment relative to the number of people needing treatment among all the States.

- Delaware, Oklahoma and Washington had different levels and types of resources allocated to the treatment of mental health and substance abuse. Revenues from State taxes and from the Federal Medicaid match and Federal block grants differed across the States. As a result, the types of programs States implemented and the services they covered for treatment of MI and SUD varied. An early study of the IDB data found that the three States varied significantly in the services covered (Coffey et al., 2001). For example, Delaware provided an innovative Program of Assertive Community Treatment. Oklahoma and Washington did not provide a comparable program at the time of this study. The States also varied in the extent of managed care arrangements with health plans, affecting providers who were reimbursed under Medicaid.

- There were differences in the allocation of resources among State agencies involved in MH/SA treatment services. This study was limited to Medicaid, MH agencies, and SA agencies. However, other State organizations may have been involved in financing or providing some MH/SA treatment, including departments of corrections, education, and

child welfare. These other departments may have been allocated more or less of the total sum of State spending on MH and SA services and, thus, spending through the Medicaid, MH, and SA agencies may have appeared to be different, even if total spending was similar across the States.

Because of these and other differences, this study did not attempt to interpret differences in utilization and expenditures State-by-State. The amount of variation among the States in the treatment of MI and SUD disorders, however, indicated that each State may need to take a wide variety of factors into account in developing a service system that will work most effectively for the treatment of clients with co-occurring disorders within each unique State matrix of services and payment structures. While clearly the eventual identification of the most effective programs for clients with co-occurring disorders is essential, some flexibility will be required for successful introduction of model programs into each unique State.

**Integrated Data Systems**

While each State adopts scientific advances about the best treatment for persons with co-occurring disorders tailored to their clients' needs, the development of reliable data that can be used across components of State systems to identify persons with co-occurring disorders is an issue of critical importance. Treatment programs need to be effective for clients and subject to continuous quality monitoring. And, quality improvement cannot be carried out without adequate data. Data systems are needed that:

- Allow for identification and tracking of clients across payment systems and systems of care. Some State data systems remain disconnected; common client identification numbers, which enable data integration, are not available and are typically not developed.

- Collect sufficient information so that the State can monitor the current system of care while improving the system to deliver high quality care with maximal efficiency. Such information, at a minimum, would include client demographic information, diagnoses, types of procedure, units of service, types of provider, amounts spent, and payers of services provided.

- Utilize uniform data elements with uniform or somewhat uniform definitions across systems. While the phased-in implementation of the Health Insurance Portability and Accountability Act of 1996 (HIPAA) will continue to facilitate integration for systems based on claims transactions, such as Medicaid or commercial claims, standardization of other data elements will still be required. State MH/SA agencies may want to study HIPAA claims transaction standards as a guide to improved design of internal administrative data systems of client encounters. This would allow for the eventual alignment of their data collection system with Medicaid claims.

With integrated uniform client, utilization, and payment information, researchers could conduct better studies of MI and SUD clients and services that would be highly relevant to public policymakers. Patterns of treatment with residential, outpatient, and pharmacotherapy services may potentially be better understood. Outcomes could be assessed through other information

systems, including unemployment records, educational achievements, arrest records, and death records. Some States have already begun to collect and use such data to inform their decision-making.

During State budget crises, when many State-funded health services retract, it may be difficult to address data-collection deficiencies. Yet, more efficient service delivery requires better information. Even in times of budget cuts, it would be important to know if diminishing services in one program merely shift the costs to other State programs, thereby diluting the savings that are sought. With adequate data, States could plan resources to address clients, their special needs, and targeted services, and States could find more efficient ways to deliver those services within limited State budgets.

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# Appendix A: Methods

## Client Linking in the Integrated Data Base (IDB)

The SAMHSA IDB Project, which assembled data across different health care programs within the States of Delaware, Oklahoma, and Washington, dealt with the methodological complications of combining data collected for different purposes by different organizations on the same (and different) clients. Each program served a defined population and had overlapping records with other programs to different degrees. The overlaps occurred between MH/SA agencies and Medicaid and between MH and SA agencies. Unique synthetic client identifiers, which linked the same clients across data sources, were developed as part of the IDB. The probabilistic linking methodology was based on Social Security Numbers, Medicaid ID numbers (sometimes available in MH/SA files), first name, middle initial, last name, maiden name, date of birth, race, gender, and ZIP Code, when available.

For the total IDB file for 1996 (the first year of the databases which was collected for years 1996-1998), the percent of MH/SA agency clients linked to Medicaid recipients was 42 percent for Delaware, 33 percent for Oklahoma, 39 percent for the Washington SA agency, and 58 percent for the Washington MH agency. Linkages between the Washington MH and SA agencies came from 20 percent of all SA clients and 8 percent of all MH clients. (These latter linkage percents differed because the contributing files (MH and SA) differed in size.) For further information on probabilistic linking for the IDB, see Whalen et al. (2000).

The uniform client identifiers across data sources made this study of co-occurring disorders possible. For further information on the development of the IDB, see Graver et al. (2001), a technical manual, or Coffey et al. (2001), an overview of the IDB development and the first analysis of the data. The sections below describe the methodological issues tackled for this study.

## Study population

The study population included a subset of clients of MH, SA, and Medicaid agencies in the three States in 1997 and all their relevant service records for mental illness (MI) and substance-use disorder (SUD) treatment. The client subset in each State included those with primary[3] MI or SUD diagnoses or with agency-specific MH or SA services who were under the age of 65 (excluding those with no age data). Relevant service records were those for MI or SUD treatment and, thus, excluded records for dental services, durable medical equipment, and services specific to a diagnosis for mental retardation or developmental disabilities (MRDD). Services for MRDD clients were included only if the service record identified a primary mental or substance-use disorder. In Washington and Oklahoma, Medicaid records with specific MI or SUD procedures with non-specific or invalid diagnoses were added for clients in the database. Table A.1 shows the numbers of clients in the original IDB analysis file and in the subset analyzed for this study by State.

[3] Secondary diagnoses were not used to identify clients with MI or with SUD because treatment may not have been provided for secondary MD or SUD; this method insured that expenditures related to MD and SUD treatment. However, in identifying clients with co-occurring MI&SUD, secondary diagnoses were used.

Table A.1 also shows the percent of client-service records relevant for this study without expenditures before imputation. While Oklahoma had 4 percent of client records without expenditures; Delaware and Washington had 13 and 14 percent, respectively. The missing expenditures for Delaware occurred for several reasons. First, Delaware submitted a large proportion of Medicaid encounter records, and all dollar amounts on encounters were set to zero during the original data processing because State analysts said costs on such records were unreliable. Second, the Delaware MH/SA agency submitted a number of records for which dollar amounts were not assigned originally because detail of service types and/or specific units of service and service dates were not available or records had dollar estimates derived from budgets rather than client-specific records; these were set to zero before imputation. In Washington, missing expenditures were due to a large number of Medicaid encounter records without dollar amounts and a large number of MH/SA agency records where assigned rates could not be applied. Oklahoma submitted a relatively small number of encounter records. As a result, missing values were primarily for the MH agency records. For this expenditure study, imputations were used to assign values to records with missing dollar values (as explained in the next section).

**Table A.1: Study Population, 1997**

| Population | Delaware | Oklahoma | Washington | Total |
|---|---|---|---|---|
| Clients in the IDB | 27,702 | 138,740 | 204,315 | 370,757 |
| Clients in IDB expenditure study[a] | 18,469 | 90,322 | 154,306 | 263,097 |
| Client-service records in IDB expenditure study | 533,267 | 2,051,764 | 4,959,347 | 7,544,378 |
| Client-service records without expenditures before imputation[b] | | | | |
| Number | 71,775 | 81,929 | 702,100 | 855,804 |
| Percent | 13.5% | 4.0% | 14.2% | 11.3% |

[a]The expenditure study included those with primary MI or SUD diagnoses or with agency-specific services who were under age 65. Thus, clients excluded were those aged 65 and over, those with no age data, those with only secondary diagnostic evidence of MI or SUD (i.e., no service records with a primary diagnosis of MI or SUD nor agency-specific MI or SUD services). The diagnostic exclusions omitted those treated for somatic illness who have only an MI or SUD secondary diagnosis.

[b]Services excluded were those for dental treatment, durable medical equipment, and treatment for mental retardation and developmental disabilities (except when the latter were treated for MI or SUD). Imputation is described in a later section of this Appendix. In Oklahoma, administrative records for 37,479 social services provided by State employees also were removed from the study. Dummy records used to account for known missing information -- including capitation payments to RSNs in Washington -- were not counted in the record counts above.

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

**Counting services and expenditures accurately**

There were three main challenges to using administrative data from the IDB for an expenditure analysis. 1) Missing expenditures: Not all records included expenditures for services provided. 2) Shared records: Linked records from two information systems could represent double accounting on the same clients. 3) Accurate counting: Shared services and expenditures across two data sources must be counted from only one source for accurate estimates.

1. **Missing Expenditures.** Administrative data were frequently incomplete. This could be caused by administrative decisions and rules about which items to request, which items to require, and which items to make optional. Also, long-standing payer-provider arrangements may have allowed record-keeping to become relaxed, when "required" items were not essential for the payment transaction. For example, agencies that made "capitation" payments to providers, rather than pay fees for specific services (fee-for-service payments), often did not require service detail and "amount claimed" information. The expansion of capitated payments to providers resulted in a growing incompleteness of expense data at the service level.

The MH/SA agencies, for the most part, collected no payment information. However, during development of the IDB, the States provided estimates of the expenses they incurred for specific types of services, where they could, and these estimates were applied to service records. A certain percentage of records could not be estimated with dollar values. As a result, for Oklahoma in 1997, 6 percent of all MH and/or SA clients had no expenditures on any of their service records; for Delaware, it was 13 percent; and for Washington, 15 percent.

When missing data vary systematically, it can be a source of bias in program statistics. When records with incomplete data are simply discarded, they are effectively imputed to the mean estimate. If clients and services are typical, then the impact is benign. If clients and services are atypical, then the impact is to bias the estimates.

Imputation methods can be used to deal with systematically missing data. This study used "hot deck" imputation methods to deal with missing expenditures. Hot deck imputation uses random selection, within homogeneous client-service groups, of client-service records with expenditures to serve as "donors" for client-services without expenditures ("recipients"). In this instance, homogeneous client-service groups include records with the same type of service, type of payment, client diagnosis, and client age. The advantage of "hot deck" imputation is that it preserves the variance that exists among donors in the final imputed records. For more details on the imputations, see *Missing Expenditures and Imputation* in this Appendix. When entire sets of records were missing, dollars were not imputed. For example, pharmaceutical costs for persons tracked only by MH/SA agencies were not imputed because there were no records for pharmaceuticals that may have been prescribed by these agencies and, thus, no basis for an estimate.

2. **Identifying "Shared" Records.** State agencies that covered the cost of care for the same clients usually each kept separate records for those clients and services in separate and

independent information systems. These are referred to as "shared" records in this report. Counting services or expenditures from "shared" records without taking this double entry into account can result in over counting of total MH/SA services and expenses, especially since the IDB processing assigned dollars to MH/SA agency service records based on their fee schedules and since this study imputed expenditures to records that did not contain expenses. In an earlier analysis, IDB clients across the three States differed in terms of proportions of shared records. In Washington in 1996, 11 percent of records with reported dollars were shared between the MH/SA agencies and Medicaid; in Oklahoma, it was 12 percent; and in Delaware, 39 percent.

To make estimates comparable, shared services were handled the same way across the States. Records (e.g., Medicaid and MH/SA agency records) with the same uniform client identifier, provider identifier, and date of service were flagged as duplicate or overlapping records. When record-keeping systems used spans of dates, rather than individual service dates, to identify periods of service, records with individual service dates that overlapped records with span dates also were flagged as shared-service records. More elaborate flags for shared records were set to enable the counting of various types of services and expenses without duplication or overlap.

3. **Counting As Accurately As Possible.** The challenge with dual record-keeping is deciding whose data to use to count services and expenditures. If the dollars on shared service records are identical, it does not matter which source is used, as long as only one source is used. When the dollars on the shared service records differ, the size of the annual estimate will depend on the source used. Why would the dollars differ? When the MH agency and Medicaid each record a payment for a service, they may record the amount differently. For example, especially since most of the MH/SA dollar amounts were based on fee schedules or allowed amounts, Medicaid paid amounts for the same service may differ, or the Medicaid agency may record a monthly capitation payment they make to the MH agency. Furthermore, even if the MH agency did not record service dollars, service dollars were imputed to those records, as described above, so those will certainly differ from the companion shared service record.

To count the expenditures reliably, upper and lower bounds on service dollars were defined. The upper bound represents the higher of the two categories of expenditures (within the same treatment settings) between the two data sources that are recorded as shared records. The lower bound represents the lower of those.

One final issue regarding accuracy: The estimates of average cost per client per year reflect the amount State programs spend per client per year, regardless of whether the client is continuing treatment started in a prior year or starting care that may be completed in the following year. That is, these estimates do not necessarily capture all of the expenses for an episode of care that a client starts (or completes) in a year. To the extent that MI&SUD clients have longer episodes of care than single-diagnosis clients, expenses on an episode basis for single-diagnosis clients will be greater. Program spending per client per year is one basis for making comparisons among different types of clients. It is not known whether the omission of some client start-up or follow-on expenses has a disproportionate effect on

MI&SUD clients relative to clients with MI or SUD alone, but it is possible that MI&SUD expenses are underestimated as a result of truncation of events that occur in another calendar year.

4. **External Validation.** When estimates must be derived from data that have been imputed or adjusted, it is important to validate the results against external estimates, if possible. Table 1.1 (in Chapter 1) compared subsets of estimates by State from this study to estimates that had been generated by the States for other purposes. This table showed that in some instances the estimates from this IDB study were very close to (within 5 percent of) the States' various estimates. In other cases, the estimates were quite different (nearly 60 percent in one case and 30 percent in another where capitation payment records were involved). Generally, the total expenditure estimates may have differed because there were gaps in records in either source. Generally, estimates from this IDB-based study should be higher than the State-generated estimates because 1) the IDB imputed missing values and the State agency databases generally did not and 2) the IDB imputed dollars for managed care records from fee-for-service records, which meant that any managed care discounts were not incorporated. However, the two large differences, out of the eight unique comparisons made, were well above the amounts that were imputed. While the reasons for the magnitude of these differences were unclear, they remained as a warning about the pitfalls of combining information from databases that use different methods, different definitions, and have systematic missing data in their records.

**Defining co-occurring illnesses and comparison subgroups in the IDB**

The IDB Project scanned primary diagnoses for each client and created a flag indicator for whether or not they were a client with MI and/or SUD. From those flags scanned across all of their service records and any program-intake records, clients could be described as MI only, SUD only, or clients with both MI&SUD. When diagnoses were not present on client records, evidence of service from a MH or SA agency were used to identify MI or SUD clients when the service was specific to MI or SUD. Integrated programs for MI and SUD clients also were used to indicate clients with co-occurring disorders. The ICD-9-CM codes used to identify mental disorders and substance-use disorders are shown in Table A.2. Table 2.1 in Chapter 2 shows the percent of clients with MI&SUD by source of the information.

**Defining types of service**

Services were organized into four major categories: inpatient, residential, outpatient, and pharmaceutical. The outpatient category was further divided into sub-categories of intensive outpatient, methadone outpatient, case management (including wrap-around and transportation services), and routine outpatient (including individual and group therapy sessions, laboratory and x-ray services). State-specific codes referred to intensive outpatient services for substance abuse treatment and to partial day hospital for mental health treatments.

**Table A.2: Diagnosis codes for mental illness (MI) and substance-use disorders (SUD), 1997**

| Diagnosis | ICD-9-CM diagnosis codes |
|---|---|
| Mental Disorders | |
| Schizophrenia | 295 |
| Major depression | 296.2, 296.3 |
| Other psychoses | 296.0, 296.1, 296.4-296.99, 297, 298, 299 |
| Stress & adjustment reactions | 308, 309 |
| Childhood attention deficit disorders (ADD) | 314.0, 314.00, 314.01 |
| Other childhood disorders, non-ADD | 307, 312-313, 314, 314.02-314.99 |
| Mood disorders | 300, 301.13, 311 |
| All other disorders | 302, 306, 310, 301, exc. 301.13 |
| Substance Use Disorders | |
| Alcohol psychoses, abuse, and dependence | 291, 303, 305.0 |
| Drug psychoses, abuse, and dependence | 292, 304, 305.2-305.9 |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

To attempt to measure the intensity of MI and SUD treatments more consistently, another definition based on hours of treatment per service record was used when hours were available on records. Two definitions were tried: 1) services provided two or more hours per record and 2) services provided four or more hours per record. With this approach, additional records were identified (Table A.3). However, these hour-based definitions did not track well with other definitions used in current treatment practices. Based on information from the Treatment Improvement Exchange (TIP, 2003), intensive outpatient service is a concept used in substance abuse treatment programs for short-term programs designed to provide different intensities of clinical programming per week: 9 or more hours a week for intensive outpatient treatment or 20 or more hours a week for partial hospitalization (TIP, 2003). The services may be provided during the day, in the evening or on weekends. The term is not used in treatment of mental illness; rather partial hospitalization programs provide intensive services for part or full days during periods after school, in the evening, on weekends, and in summer day programs. As a result, the hours-based approach of identifying intensive outpatient records could not be constructed to be truly comparable across the MI and SUD treatment programs and, thus, it was abandoned in favor of the code-based definitions. The codes are listed in footnote a, Table A.3.

## Data Collection Differences Among States and Agencies

Delaware

Delaware provided data from three distinct sources. Delaware Services for Children, Youth and Their Families (DSCYF) manages services to both Medicaid managed care clients after the basic Diamond State Health Plan (DSHP) benefits are exhausted and all non-managed-care Medicaid youth. DSCYF provided service-level data with actual cost information on the

majority of records. Where cost was missing, a standard amount was applied by service code, when available, and then imputation was used. There was little missing financial data on records from DSCYF before imputation.

**Table A.3: Intensive outpatient definitions and counts of service records for MH or SA services**

| Service Records | Delaware[a] | Oklahoma[b] | Washington[c] |
|---|---|---|---|
| Intensive outpatient (IO) records -- based on SA "intensive outpatient" and MH "partial hospitalization" codes[a,b,c] | 44,605 | 693 | 442,596 |
| "Other" outpatient records with 2 or more hours of treatment per record[d] | 12,844 | 319,318 | 329,615 |
| "Other" outpatient records with 4 or more hours of treatment per record[d] | 4,577 | 168,851 | 53,771 |
| "Other" outpatient records for less than 2 hours of treatment per record[d] | 159,154 | 602,291 | 1,780,166 |

[a]Delaware State-specific IO codes included: Substance Abuse Treatment Providers: NET Foundations IO program for men, NET Foundations IO program for women, Greenwood IO program, Greenwood partial hospitalization program, BCI IV drug abuse community treatment team (CTT), PSI alcohol and drug Wilmington CTT, NET Foundations CTT, PSI (PCSA) alcohol and drug Georgetown CTT, BCI IV drug abuse CTT-methadone, NET SENTAC continuing care unit (CCU), BCI Riverfront NSAFE outpatient clinic, Open Door Turning Points. Procedure codes: YY670=intensive day treatment for substance abuse (SA), 912= full day hospital for SA or MH treatment not elsewhere classified, YY748=intensive MH services under EPSDT, YY755=day treatment for MH under EPSDT, YY760=IO for drug or alcohol individual day treatment under EPSDT. State-specific services categories also included were: IOS=intensive outpatient substance abuse, DAM=day hospital mental health, IOM=intensive outpatient mental health.

[b]Oklahoma State-specific IO codes included: 004C, day school/six hours; 432, IO substance abuse services.

[c]Washington, IO codes included: IO=intensive outpatient alcohol and other drug treatment; 2800=adult day treatment within a facility; 2810=adult day treatment outside a facility; 2840=child and adolescent day treatment within a facility; 2850=child and adolescent day treatment outside a facility; 00527M, 00528M, 00529M = voluntary acute day treatment of children with mental disorders for 4, 5, 6 hours, respectively.

[d]"Other" outpatient service records are records with single dates that had service units in minutes or hours. Rehabilitation or detoxification services were excluded. Records with 4 or more hours of treatment are a subset of records with 2 or more hours of treatment.

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

The second source of Delaware data was the Division of Substance Abuse and Mental Health (SAAMH). The majority of these records did not include expenditure information and, therefore, the Agency provided estimated costs at the provider and unit level. Beyond that, approximately six percent of costs for SAAMH records had to be imputed. For some types of service (primarily SA services), estimates were based on the budgets that SAAMH allocated to certain providers for a set number of clients. These were initially ignored during the imputation process to try to derive better estimates through imputation.

The third source of data for Delaware was Medicaid. This agency provided both fee-for-service records and a large proportion of encounter records (27 percent of Medicaid records)

from the managed care setting. The majority of encounter records had missing dollar amounts, and these were imputed using information from fee-for-service records.

Oklahoma

Oklahoma provided data from two data sources. The Department of Mental Health and Substance Abuse Services (DMHSAS) provided MH/SA agency data, and the Oklahoma Health Care Authority (OHCA) provided Medicaid data. DMHSAS has an established integrated data system for mental and substance-use disorders clients. As a result, the data were consistent and rates were available for most services.

OHCA provided both fee-for-service and encounter records (all encounter records were missing dollar amounts). However, the proportion of encounter data was small in comparison to other States; thus, the proportion of missing dollars that was imputed also was small (2 percent).

Washington

Washington provided data from three sources: the State Mental Health Agency (SMHA); the Division of Alcohol and Substance Abuse (DASA); and the Medical Assistance Administration (MAA), responsible for Medicaid. Data collection issues were specific to each of these data sources.

For SMHA, the two issues were – underestimation of outpatient service dollars and lack of residential services data. By 1996, SMHA had switched almost entirely to managed care supported by Medicaid. For Medicaid service records, almost none had expenses per service because they were paid under a capitation model. Washington State provided the most current information available for outpatient services, which were FY 1994 rates. An inflation factor was used to assign 1997 rates at the service level. Community hospital inpatient records contained cost information; in addition, SMHA provided current per diem information for each of the four State Hospitals. For residential services, SMHA did not collect and, thus, could not provide residential treatment data; as a result, residential expenditures and total expenditures for Washington were underestimated in this study of co-occurring illnesses.

Washington's DASA provided service information and estimated costs at the service level. However, after application of the estimation algorithm approximately 25 percent of the DASA service-level records could not be assigned expenditures. These were then assigned in the imputation process.

Washington's MAA provided both fee-for-service and encounter records. All encounter records were missing dollar amounts, as in the other States. In addition, two other biases exist in the MAA data. First, the data set contained no State Hospital information (even for those under 21 or over 65 years of age who were eligible for payment for this service). Therefore, Medicaid inpatient costs were probably underestimated. Second, MAA data contain no outpatient MH managed care data because the network of providers was not required to submit encounter data. This population included non-disabled children and adults. Therefore,

expense information was only available through SMHA; thus, the Medicaid outpatient expenses also may be underestimated for Washington.

Other issues with State data

Managed care in both Delaware and Oklahoma operates under the 1115a authority. Although the Centers for Medicare and Medicaid Services (CMS) did not require submission of encounter data in 1996, Delaware was already collecting data and Oklahoma was only beginning to collect encounter data. Even though the Washington fee-for-service system was in transition to managed care as early as 1994, it operates under the 1915b authority and no encounter data submission requirements exist. Thus, the amount of managed care data in each States' database may be the result of timing of a State's transition to managed care and whether they elected to collect such data as part of their State's waiver.

Related to the issue of missing information on records provided is an even larger issue of whether the agency actually keeps records on certain clients. For example, at the time, Medicaid clients in Washington, who were under managed care, received their services through a network of pre-paid healthcare providers referred to as Regional Support Networks (RSNs). (The RSNs also provided care to non-Medicaid low-income clients who were severely mentally or emotionally ill.) Because the Medicaid agency required no billing for Medicaid managed care clients and received no data from the RSNs, these clients were not represented in the Medicaid database obtained for this study. Consequently, there was no opportunity to link the Medicaid-supported managed care clients directly with the MH clients served through the MH Agency. By looking at the data available, one might assume that the MH agency supported these clients exclusively. To reduce this problem, the category of service by MH agency and Medicaid was assigned to those SMHA clients found in the Medicaid eligibility file during the period of the service. A dummy Medicaid capitated payment record was then assigned per enrollee based on information provided by the State. However, had the clients' services been linked, the correlation of high expenses for clients tracked by MH/SA agencies across the States may have been different.

**Missing Expenditures and Imputation**

"Expenditures" in this study refer to paid amounts on Medicaid claims and recorded or estimated costs on client service-level records for State MH/SA agencies, and imputed amounts on service records that did not include dollar values.

As mentioned above, administrative data are frequently incomplete. In an earlier analysis, IDB clients across the three States differed in terms of completeness of data. In Oklahoma in 1996, 88 percent of clients had expenditures on all of their service records; in Washington, it was 53 percent; and in Delaware, it was 28 percent. For this reason, effort was devoted to understanding and handling missing expenditures in the current analysis.

Imputations were made in two different ways. First, dollar amounts were assigned based on institutional knowledge of State analysts. Second, dollar amounts were imputed using "hot deck" imputation techniques.

Amounts based on institutional knowledge

In the development of the IDB, service-level expenses were imputed when a State provided rates for specific service codes. Oklahoma provided such information for a majority of procedure codes, and therefore, the expenditure data for Oklahoma were relatively complete. Washington also provided some service-specific rates. Although Delaware was able to provide many service-specific rates, these rates could not be applied because of missing quantities (e.g., number of days) or missing service dates needed for such calculations. Delaware provided estimated agency budgets allocated to providers and total counts of clients served. These were assigned to client records in the development of the IDB, but ignored during the "hot deck" imputation process. Some of these were later used in cases where imputed values appeared unreasonable.

Washington State Medicaid expenditures for outpatient MI or SUD services under managed care were not provided to the IDB Project because the payments were made by Medicaid in a lump sum payment to the Regional Support Networks—the network of providers of MH/SA services in the State—and were not recorded by Medicaid client. Such expenses were recorded by client on the MH/SA agency side. To adjust for this omitted information (which was available in the other States, a Medicaid record was created for an estimated capitation amount of $24.71, obtained from the State, for each month of eligibility for such clients.

Despite these assignments, a substantial amount of missing expenses remained on IDB service records in 1997. Across Delaware, Oklahoma, and Washington, 13, 6, and 15 percent, respectively, of service records did not have expenditures associated with them.

Amounts based on hot deck techniques

To conduct this expenditure study more accurately, "hot deck" imputation methods were used to deal with missing expenditures that may not have been typical of the average client's utilization. Hot deck imputation uses random selection, within homogeneous client-service groups, of client-service records with expenditures to serve as "donors" for clients without expenditures ("recipients"). In this instance, homogeneous client-service groups included records with the same type of service, type of payment, client diagnosis, and client age. The advantage of "hot deck" imputation is that it preserves the variance that exists among donors in the final imputed records. Tables A.4 and A.5 below provide more detail on the strata used for imputations and the proportion of records imputed in each round of collapsing of the strata, until all missing expenditures were imputed.

Study population service records were stratified by the categories listed below and then non-missing records were used to donate expenditure values to records with missing expenditures. Only records with positive dollar values, not imputed in previous rounds, were used as donors.

The imputation process continually collapses categories of records until all of the records are imputed. The scheme shown in Table A.4 details how categories were collapsed so that there

would be enough records to provide donors. Records that could be assigned without collapsing were assigned first from the more homogeneous groups; remaining records with missing expenses were assigned values after subsequent collapsing. For example, strata were never collapsed by State or major type of service. But other characteristics were combined to provide enough donor records. Collapsing occurred across type-of-payment records (e.g., fee-for-service and encounter), age groups, diagnoses, service units, and some specific types of outpatient records (noted below). The rule for "enough" donor records was initially set at 20 percent or more, and then in the last round that rule was relaxed to below 20 percent.

Table A.5 below shows the percents imputed at each stage of the process. According to Table A.5, the 13, 4, and 14 percent imputed of all service records in the three states were imputed at varying stages by State. More of Delaware's records were imputed in later rounds, while a substantial portion of Oklahoma and Washington State records were imputed within client identifier and within the full stratification. Imputations in the earlier rounds are likely to be more accurate because the groups are more homogeneous.

Table A.6 shows the number and percent of all records imputed with donors at 50, 20 or more, and less than 20 percent of observations in each stratum. The more stringent 50-percent donor-size requirement was satisfied most of the time, as can be seen in Table A.6.

**Table A.4: Strata for imputing expenditures to agency and Medicaid event records**

| Stratification Category | Strata components | Strata components collapsed at round[a] |
|---|---|---|
| State | Delaware | (Never) |
| | Oklahoma | (Never) |
| | Washington | (Never) |
| Type of Service | Inpatient State (or private) MH/SA Hospital | (Never) |
| | Inpatient Community Hospital | (Never) |
| | Residential | (Never) |
| | Outpatient regular (non-methadone) | |
| | Lab/x-ray | 5 |
| | Transportation | 5 |
| | Case management/administration | 5 |
| | Wrap-around services | 5 |
| | Other (other, unavailable, unknown, invalid) | 5 |
| | Outpatient intensive (non-methadone) | (Never) |
| | Outpatient methadone | (Never) |
| Type of Payment Record | Agency service-based | 2 |
| | Medicaid service-based fee-for-service (FFS) | 2 |
| | Medicaid service-based encounter | 2 |
| | Agency service program (budget dollars) | 2 |
| | Agency behavioral health (BH) capitation | 2 |
| | Medicaid BH capitation | 2 |
| Age | Youth (< 18) | 3 |
| | Adult (18-64) | 3 |
| Services for MI/SUD | Services for MI | 4 |
| | Detoxification services for SUD | 4 |
| | Non-detoxification services for SUD | 4 |
| Type of units | Days, weeks, months (in days) | 6 |
| | Minutes, hours (in minutes) | 6 |
| | Visits | 6 |
| | Unspecified | 6 |
| | Other (counts of procedures, non-timed events, etc.) | 6 |

[a]Round 0 was imputed within above strata and also within client identifier. Round 1 was imputed within above strata without client identifier, requiring donors to be 20 percent or more of a stratum's observations. Round 7 eliminated the donor-size rule and involved some “further” collapsing of strata.
Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

**Table A.5: Results of imputing expenditures to MH/SA and Medicaid agency event records,[a] relative to all client service records collapsing strata with insufficient donors, by State, 1997**

| Round of Hot Deck Imputation | Delaware | | Oklahoma | | Washington | |
|---|---|---|---|---|---|---|
| | Imputed | Missing | Imputed | Missing | Imputed | Missing |
| Before Imputation: | | | | | | |
| Number | 0 | 71,775 | 0 | 81,929 | 0 | 702,082 |
| Percent | 0.0% | 13.3% | 0.0% | 4.0% | 0.0% | 14.2% |
| After Round 0: | | | | | | |
| Number | 3,912 | 67,863 | 60,483 | 21,446 | 302,382 | 399,700 |
| Percent | 0.7% | 12.6% | 2.9% | 1.0% | 6.1% | 8.1% |
| After Round 1: | | | | | | |
| Number | 12,256 | 59,519 | 72,905 | 9,024 | 460,859 | 241,223 |
| Percent | 2.3% | 11.1% | 3.6% | 0.4% | 9.3% | 4.9% |
| After Round 2: | | | | | | |
| Number | 19,203 | 52,572 | 81,861 | 68 | 530,232 | 171,850 |
| Percent | 3.6% | 9.8% | 4.0% | 0.0% | 10.7% | 3.5% |
| After Round 3: | | | | | | |
| Number | 20,153 | 51,622 | 81,865 | 64 | 530,382 | 171,700 |
| Percent | 3.7% | 9.6% | 4.0% | 0.0% | 10.7% | 3.5% |
| After Round 4: | | | | | | |
| Number | 23,045 | 48,730 | 81,880 | 49 | 537,295 | 164,787 |
| Percent | 4.3% | 9.1% | 4.0% | 0.0% | 10.8% | 3.3% |
| After Round 5: | | | | | | |
| Number | 25,335 | 46,440 | 81,880 | 49 | 537,707 | 164,375 |
| Percent | 4.7% | 8.6% | 4.0% | 0.0% | 10.8% | 3.3% |
| After Round 6: | | | | | | |
| Number | 25,335 | 46,440 | 81,880 | 49 | 538,411 | 163,671 |
| Percent | 4.7% | 8.6% | 4.0% | 0.0% | 10.9% | 3.3% |
| After Round 7[a]: | | | | | | |
| Number | 71,775 | 0 | 81,929 | 0 | 702,082 | 0 |
| Percent | 13.3% | 0.0% | 4.0% | 0.0% | 14.2% | 0.0% |

[a]After checking imputations by service and type of record, some hot deck imputations were reassigned (in a round 8) to the group mean or to some other value based on input from the States; this occurred for 5.7% (4,127) of DE and 1.9% (13,304) of WA imputed records. Also, hot deck imputation was not used for prescription drug records; missing retail drug dollars on Medicaid encounter records for prescriptions were assigned the mean for the drug class. Medicaid encounter prescriptions with missing expenditures were: DE=0.0%, OK=10.2%, WA=16.4%. Some other reassignments were made after imputation when records were not correctly stratified (e.g., outpatient records that were really services at inpatient settings).

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

**Table A.6: Summary of imputed records as a percent of all client records, by percent of records within stratum used as donors (donor size), by State, 1997**

| Donor size | Metric | Delaware | Oklahoma | Washington |
|---|---|---|---|---|
| Less than 20 percent of stratum | Number | 8,554 | 0 | 113,277 |
| | Percent | 1.6% | 0.0% | 3.6% |
| 20 to 50% of stratum | Number | 6,742 | 14,494 | 74,388 |
| | Percent | 1.3% | 0.7% | 2.4% |
| More than 50% of stratum | Number | 56,479 | 104,865 | 270,873 |
| | Percent | 10.5% | 5.2% | 8.6% |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

Outside of the above scheme, Medicaid prescription drug dollar amounts were imputed when those dollars were missing on the record, based on the average expense by drug class in each State. Pharmaceutical dollars for MH/SA agency records were not imputed because MH/SA agencies collected no information on prescribed medications.

## Identifying Shared Services

Agencies that share the cost of care for the same clients usually each keep records on those client services. Dual accounting of expenses, while perfectly reasonable when more than one program is responsible for a client, can cause analysts to inflate estimates and bias comparisons across various dimensions, if the problem is not handled in the analysis. In an earlier analysis, IDB clients across the three States differed in terms of proportions of shared records. In Washington, for 1996, 11 percent of records with reported dollars were shared or overlapped between the MH/SA agencies and Medicaid; in Oklahoma, it was 12 percent; and in Delaware, it was 39 percent.

To identify shared records in 1997, records were scanned for evidence of identical services on both sets of records (Medicaid and MH/SA agency). (This process was not applied to records between MH and SA agencies, because those records represented services for different types of disorders and were not shared in the sense of duplicate or overlapping accounting.) The evidence included the same uniform client identifier, type of service, and date of service. When this was found, an indicator (or flag) was set to identify the shared records (Table A.7). When record-keeping systems used spans of dates (rather than individual service dates) to identify periods of service, records with individual service dates that overlapped records with span dates were flagged as shared service records.

**Table A.7: Method for flagging shared service records and potential overlap**

| Flag | Application | Definition |
|---|---|---|
| SHAREFLAG: | Set on the Medicaid and Agency service record(s): | 1 If shared service of same type of service on same day or span of days<br>0 If not shared service |
| CAPFLAG: | Set on the Medicaid and Agency service record(s): | 1 If service record overlaps with a BH capitation record<br>0 Otherwise |
| ASRVFLAG: | Set on capitation payment records (Medicaid): | 1 If Medicaid BH capitation record overlaps with at least one Agency service record (in any type of service)<br>0 Otherwise |
| MSRVFLAG: | Set on capitation payment records (Medicaid): | 1 If Medicaid BH capitation payment record overlaps with at least one Medicaid service record<br>0 Otherwise |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

More elaborate flags for specific types of shared records (Table A.8) were set to enable counting of various types of services and expenses.

**Table A.8: Flags and categories for counting unduplicated expenditures**

| Type of record | Service-record level flags (defined in Table A.7): SHAREFLAG | CAPFLAG | ASRVFLAG | MSRVFLAG | Client-level summary category |
|---|---|---|---|---|---|
| Agency Service Record | | | | | |
| | 0 | 0 | | | A |
| | 1 | 0 | | | B |
| | 0 | 1 | | | C |
| | 1 | 1 | | | D |
| Medicaid Service Record | | | | | |
| | 0 | 0 | | | E |
| | 1 | 0 | | | F |
| | 0 | 1 | | | G |
| | 1 | 1 | | | H |
| Medicaid Capitation Payment Record | | | | | |
| | | | 0 | 0 | I |
| | | | 1 | 0 | J |
| | | | 0 | 1 | K |
| | | | 1 | 1 | L |

Note: The client-level summary categories are summed up at the end of the year for the comparisons below. The use of different categories for shared and non-shared services and shared/non-shared service and capitation payments distinguish the sums that potentially overlap from the sums that do not overlap.

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

## Counting Expenditures

For records that were flagged as being shared, only one source of expenditure data was used in the calculations of spending by client, based on the formulas in Table A.9.

To assess the amount of double counting and the potential for different estimates based on different sources, upper and lower bounds on service dollars were defined within type of service categories. The upper bound represents the higher value of 1) State agency yearly dollars summed across relevant cost compilation categories within service type that are flagged as shared or 2) Medicaid yearly dollars summed across relevant cost compilation categories within service type flagged as shared. The lower bound represented the lower of those two summed values. Costs of shared records were always determined within a single type of service category.

As a result of this methodology, the proportion of services that were shared across the MH/SA and Medicaid agencies could be identified and counted. The percent of the 5,774,379 service records in this study that were tracked by both MH/SA agencies and Medicaid was 7 percent or 401,599 records. This was large enough to affect estimates of utilization and expenditures especially if tracking was more or less redundant for certain types of services. Table A.10 shows that dual accounting occurred more often in some States than others and more in some services than others. For example, shared accounting on services was lowest for Delaware,

**Table A.9: Formulas for calculating non-overlapping expenditures (based on client-level summary categories defined in Table A-8).**

| Expenditure | MH/SA agency service record | Medicaid service record | Medicaid capitation payment record |
|---|---|---|---|
| Total Expenditures (with overlaps, if also added across columns) | A+B+C+D | E+F+G+H | I+J+K+L |
| Upper Bound: Non-overlapping services across MH/SA and Medicaid agencies | A+ max(B+D, F+H) + C + E + G | | |
| Lower Bound: Non-overlapping services across MH/SA and Medicaid agencies | A+ min(B+D, F+H) + C + E + G | | |
| (Upper Bound)[a]: Non-overlapping services/capitation across MH/SA and Medicaid agencies and within Medicaid (i.e., Medicaid service to Medicaid capitation payment) | A + max(C, J+L) + max[{B + max(D, J+L)}, {F + max(H, J+L)}] + E + max(G, K+L) + I | | |
| (Lower Bound)[a]: Non-overlapping services/capitation across MH/SA and Medicaid agencies and within Medicaid | A + min(C, J+L) + min[{B + min(D, J+L)}, {F+ min(H, J+L)}] + E + min(G, K+L) + I | | |

[a]Potential for over-counting occurs with this method if K + L > G and [{J+L > H and (F+J+L > (B + max(D,J+L))} or {J+L>D and (B+J+L > (F+ max(H,J+L))}]. Then L becomes over-counted by up to three times. Also J could be over-counted by up to two times. However, the incidence of this is minimal.

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

relatively low for Oklahoma, but fairly substantial for Washington State. Furthermore, in Washington, inpatient services were 50 to 70 percent shared in the two agency systems. And also, this dual accounting was highest for clients with co-occurring disorders, as one might expect, because these clients were more likely to be supported by multiple programs. If the estimates were not adjusted for this double counting, the expenditure estimates would have been biased due to accounting practices and differentially across the States. Although all sources of bias in the estimates could not be ruled out, double counting was eliminated.

**Table A.10: Percent of service records (excluding capitation payments) that were shared by type of disorder, type of service,[a] and State, 1997**

| | Service records--all | | Inpatient records | | Residential records | | Outpatient records | |
|---|---|---|---|---|---|---|---|---|
| | Number | Percent shared | Number | Percent shared | Number | Percent shared | Number | Percent shared |
| Delaware | | | | | | | | |
| MI&SUD | 172,864 | 4.0% | 1,512 | 2.1% | 692 | 3.9% | 170,660 | 4.1% |
| MI only | 300,263 | 2.4% | 1,846 | 1.2% | 3,377 | 2.5% | 295,040 | 2.4% |
| SUD only | 58,062 | 0.5% | 201 | 0.0% | 737 | 0.0% | 57,124 | 0.5% |
| Oklahoma | | | | | | | | |
| MI&SUD | 556,446 | 6.4% | 34,807 | 2.4% | 16,631 | 0.0% | 505,008 | 6.9% |
| MI only | 1,372,788 | 5.8% | 39,309 | 0.3% | 16,261 | 0.0% | 1,317,218 | 6.1% |
| SUD only | 122,529 | 0.0% | 177 | 0.0% | 13,686 | 0.0% | 108,666 | 0.0% |
| Washington | | | | | | | | |
| MI&SUD | 514,634 | 12.0% | 5,982 | 70.8% | 9,451 | 22.9% | 499,201 | 11.1% |
| MI only | 3,438,550 | 7.7% | 11,661 | 50.8% | b | b | 3,426,888 | 7.5% |
| SUD only | 645,555 | 7.9% | 1,050 | 47.2% | 20,978 | 14.0% | 623,527 | 7.6% |

[a]Medicaid retail prescriptions were never shared services, because only Medicaid recorded them.

[b]The MH and Medicaid agencies in Washington did not maintain records for residential services; the SA agency in Washington did.

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

## Estimates Chosen for the Report

Annual expenditure per client was the traditional measure used to summarize expenditures across programs or states. It took into account different sizes of programs across States as well as the use of services and the prices for those services. It was used here to summarize the mean or average level of expenditures across clients in subgroups. Means were chosen as the statistic of choice (over medians), so that the actual average dollars expended per person could be calculated and used by States and others to better understand the impact of policy decisions related to service systems for persons with co-occurring mental illness and substance-use disorders.

# Appendix B. Tables of Expenditures for Co-Occurring Illnesses by Youth and Adult Groups

This appendix replicates some tables in the text, adding breakdowns by age group. Youth are those aged 17 and under. Adults are those aged 18 through 64. The tables are numbered as in the main text for ease of comparison, except for the prefix B. For example, Table B.3.3 is an age breakdown of Table 3.3 in the text. The exception is the last table (Table B.5.5) which provides summary data about the number of clients by age, by States, types of service and diagnostic group; it does not have a companion table in the main text.

**Table B.3.3: Agencies tracking or supporting clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), by age group and State, 1997**

| | Number of clients | | | Percent tracked or supported by MH/SA agencies only | | | Percent tracked or supported by Medicaid only | | | Percent tracked or supported by both | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | Youth | Adult | Total | Youth | Adult | Total | Youth | Adult | Total | Youth | Adult |
| Delaware | | | | | | | | | | | | |
| MI&SUD | 2,397 | 220 | 2,177 | 63.0% | 27.3% | 66.7% | 22.5% | 24.5% | 22.3% | 14.4% | 48.2% | 11.0% |
| MI only | 11,345 | 5,187 | 6,158 | 31.8% | 10.9% | 49.4% | 57.4% | 72.0% | 45.1% | 10.8% | 17.2% | 5.5% |
| SUD only | 4,727 | 122 | 4,605 | 85.8% | 45.1% | 86.9% | 11.4% | 45.9% | 10.5% | 2.7% | 9.0% | 2.5% |
| Oklahoma | | | | | | | | | | | | |
| MI&SUD | 15,604 | 1,701 | 13,903 | 83.7% | 54.3% | 87.4% | 7.6% | 24.3% | 5.5% | 8.7% | 21.4% | 7.1% |
| MI only | 63,405 | 23,525 | 39,880 | 60.0% | 41.7% | 70.8% | 35.1% | 51.1% | 25.6% | 4.9% | 7.2% | 3.6% |
| SUD only | 11,313 | 1,227 | 10,086 | 95.7% | 94.1% | 95.9% | 4.0% | 5.7% | 3.8% | 0.2% | 0.2% | 0.2% |
| Washington | | | | | | | | | | | | |
| MI&SUD | 10,388 | 1,463 | 8,925 | 39.5% | 25.6% | 41.8% | 9.3% | 11.7% | 8.9% | 51.2% | 62.7% | 49.3% |
| MI only | 109,136 | 40,090 | 69,046 | 41.7% | 35.8% | 45.1% | 24.7% | 26.9% | 23.4% | 33.6% | 37.3% | 31.5% |
| SUD only | 34,782 | 5,653 | 29,129 | 79.7% | 62.5% | 83.0% | 9.7% | 22.7% | 7.2% | 10.6% | 14.8% | 9.8% |
| Total -- Three States | | | | | | | | | | | | |
| MI&SUD | 28,389 | 3,384 | 25,005 | 65.8% | 40.1% | 69.3% | 9.5% | 18.9% | 8.2% | 24.7% | 41.0% | 22.5% |
| MI only | 183,886 | 68,802 | 115,084 | 47.4% | 35.9% | 54.3% | 30.3% | 38.6% | 25.3% | 22.3% | 25.5% | 20.4% |
| SUD only | 50,822 | 7,002 | 43,820 | 83.8% | 67.7% | 86.4% | 8.6% | 20.2% | 6.7% | 7.6% | 12.1% | 6.9% |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

**Table B.3.4: Percent of clients with specific primary diagnoses by State, type of disorder, and age for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), by age group and State, 1997**

| | MI&SUD | | | MI only | | | SUD only | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Youth | Adult | Total | Youth | Adult | Total | Youth | Adult |
| **Delaware** | | | | | | | | | |
| Number of clients | 2,397 | 220 | 2,177 | 11,345 | 5,187 | 6,158 | 4,727 | 122 | 4,605 |
| Mental disorders | | | | | | | | | |
| Schizophrenia | 20.7% | 0.0% | 22.8% | 10.4% | 0.1% | 19.1% | 0.0% | 0.0% | 0.0% |
| Major depression | 13.5% | 8.2% | 14.1% | 9.4% | 2.5% | 15.3% | 0.0% | 0.0% | 0.0% |
| Other psychoses | 12.1% | 2.3% | 13.1% | 7.0% | 3.6% | 9.8% | 0.0% | 0.0% | 0.0% |
| Stress & adjustment reactions | 11.1% | 7.7% | 11.5% | 15.9% | 5.1% | 25.0% | 0.0% | 0.0% | 0.0% |
| Childhood attention deficit disorders (ADD) | 0.8% | 8.2% | 0.1% | 12.0% | 25.6% | 0.5% | 0.0% | 0.0% | 0.0% |
| Other childhood disorders, non-ADD | 4.8% | 26.4% | 2.6% | 15.4% | 26.8% | 5.8% | 0.0% | 0.0% | 0.0% |
| Mood disorders | 7.3% | 16.4% | 6.4% | 21.7% | 34.0% | 11.4% | 0.0% | 0.0% | 0.0% |
| Other mental disorders | 2.0% | 0.0% | 2.2% | 1.3% | 0.6% | 1.9% | 0.0% | 0.0% | 0.0% |
| Mental service, w/o dx | 15.3% | 26.4% | 14.1% | 6.8% | 1.7% | 11.2% | 0.0% | 0.0% | 0.0% |
| Substance use disorders | | | | | | | | | |
| Drug abuse and dependence | 30.4% | 66.4% | 26.7% | 0.0% | 0.0% | 0.0% | 11.1% | 70.5% | 9.6% |
| Alcohol abuse and dependence | 16.4% | 16.4% | 16.4% | 0.0% | 0.0% | 0.0% | 6.7% | 20.5% | 6.4% |
| Substance abuse service, w/o dx | 10.7% | 0.5% | 11.8% | 0.0% | 0.0% | 0.0% | 82.1% | 9.0% | 84.1% |
| **Oklahoma** | | | | | | | | | |
| Number of clients | 15,604 | 1,701 | 13,903 | 63,405 | 23,525 | 39,880 | 11,313 | 1,227 | 10,086 |
| Mental disorders | | | | | | | | | |
| Schizophrenia | 17.1% | 1.0% | 19.1% | 6.9% | 0.2% | 10.8% | 0.0% | 0.0% | 0.0% |
| Major depression | 15.6% | 11.5% | 16.1% | 7.7% | 3.2% | 10.4% | 0.0% | 0.0% | 0.0% |
| Other psychoses | 13.8% | 3.6% | 15.1% | 4.7% | 1.7% | 6.5% | 0.0% | 0.0% | 0.0% |
| Stress & adjustment reactions | 13.1% | 13.8% | 13.1% | 14.0% | 10.1% | 16.3% | 0.0% | 0.0% | 0.0% |
| Childhood attention deficit disorders (ADD) | 0.3% | 2.5% | 0.1% | 6.3% | 16.5% | 0.3% | 0.0% | 0.0% | 0.0% |
| Other childhood disorders, non-ADD | 4.9% | 31.5% | 1.6% | 11.1% | 24.0% | 3.5% | 0.0% | 0.0% | 0.0% |
| Mood disorders | 4.6% | 11.3% | 3.7% | 8.1% | 14.9% | 4.1% | 0.0% | 0.0% | 0.0% |
| Other mental disorders | 1.2% | 0.4% | 1.3% | 1.0% | 0.6% | 1.3% | 0.0% | 0.0% | 0.0% |
| Mental service, w/A56o dx | 27.4% | 23.3% | 27.9% | 40.1% | 28.9% | 46.8% | 0.0% | 0.0% | 0.0% |
| Substance use disorders | | | | | | | | | |
| Drug abuse and dependence | 10.6% | 10.2% | 10.7% | 0.0% | 0.0% | 0.0% | 4.7% | 4.2% | 4.8% |
| Alcohol abuse and dependence | 8.7% | 4.2% | 9.2% | 0.0% | 0.0% | 0.0% | 4.9% | 2.9% | 5.2% |
| Substance abuse service, w/o dx | 32.6% | 29.9% | 32.9% | 0.0% | 0.0% | 0.0% | 90.4% | 92.9% | 90.1% |
| **Washington** | | | | | | | | | |
| Number of clients | 10,388 | 1,463 | 8,925 | 109,136 | 40,090 | 69,046 | 34,782 | 5,653 | 29,129 |
| Mental disorders | | | | | | | | | |
| Schizophrenia | 4.0% | 0.5% | 4.6% | 4.7% | 0.1% | 7.4% | 0.0% | 0.0% | 0.0% |
| Major depression | 9.9% | 4.6% | 10.8% | 4.1% | 1.2% | 5.8% | 0.0% | 0.0% | 0.0% |
| Other psychoses | 9.9% | 4.4% | 10.8% | 4.9% | 1.4% | 6.9% | 0.0% | 0.0% | 0.0% |
| Stress & adjustment reactions | 16.1% | 12.0% | 16.8% | 11.4% | 3.8% | 15.8% | 0.0% | 0.0% | 0.0% |
| Childhood attention deficit disorders (ADD) | 1.4% | 7.2% | 0.5% | 6.6% | 17.1% | 0.5% | 0.0% | 0.0% | 0.0% |
| Other childhood disorders, non-ADD | 3.1% | 9.2% | 2.0% | 5.4% | 8.6% | 3.5% | 0.0% | 0.0% | 0.0% |
| Mood disorders | 4.3% | 4.9% | 4.2% | 3.7% | 4.0% | 3.5% | 0.0% | 0.0% | 0.0% |
| Other mental disorders | 1.3% | 1.0% | 1.4% | 1.0% | 0.5% | 1.2% | 0.0% | 0.0% | 0.0% |
| Mental service, w/o dx | 47.3% | 54.5% | 46.1% | 58.2% | 63.2% | 55.3% | 0.0% | 0.0% | 0.0% |
| Substance use disorders | | | | | | | | | |
| Drug abuse and dependence | 27.5% | 44.0% | 24.8% | 0.0% | 0.0% | 0.0% | 21.4% | 38.7% | 18.0% |
| Alcohol abuse and dependence | 27.1% | 30.2% | 26.6% | 0.0% | 0.0% | 0.0% | 26.4% | 22.7% | 27.2% |
| Substance abuse service, w/o dx | 29.6% | 20.0% | 31.2% | 0.0% | 0.0% | 0.0% | 52.2% | 38.6% | 54.8% |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

**Table B.4.6: Type of psychotropic drugs for Medicaid MI/SUD clients with prescriptions by age group, State, and type of disorder for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | MI&SUD | | | MI only | | | SUD only | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Youth | Adult | Total | Youth | Adult | Total | Youth | Adult |
| **Delaware** | | | | | | | | | |
| Number of Medicaid MD/SUD client with psychotropic drug prescriptions | 565 | 57 | 508 | 4,280 | 2,065 | 2,215 | 154 | 2 | 152 |
| Mean psychotropic drug prescriptions per Medicaid client with such claims | 13.2 | 5.5 | 14.1 | 9.1 | 6.1 | 11.8 | 5.5 | 1.0 | 5.5 |
| Percent of such clients with prescriptions for: | | | | | | | | | |
| Antidepressants | 76.3% | 54.4% | 78.7% | 51.5% | 25.2% | 76.1% | 53.9% | 0.0% | 54.6% |
| Antipsychotics | 33.2% | 17.5% | 35.0% | 19.1% | 11.4% | 26.3% | 8.4% | 0.0% | 8.6% |
| Barbiturates | 2.1% | 1.8% | 2.2% | 0.8% | 0.6% | 1.1% | 5.8% | 50.0% | 5.3% |
| Benzodiazepines | 41.1% | 5.3% | 45.1% | 25.9% | 2.6% | 47.7% | 41.6% | 50.0% | 41.5% |
| Lithium | 6.7% | 5.3% | 6.9% | 3.4% | 1.4% | 5.2% | 0.7% | 0.0% | 0.7% |
| Other anxiolytics/sedatives/hypnotics | 32.2% | 19.3% | 33.7% | 21.3% | 16.8% | 25.5% | 31.2% | 0.0% | 31.6% |
| Stimulants | 7.4% | 50.9% | 2.6% | 39.9% | 79.1% | 3.4% | 0.0% | 0.0% | 0.0% |
| Methadone | 0.2% | 0.0% | 0.2% | 0.2% | 0.0% | 0.3% | 0.7% | 0.0% | 0.7% |
| Antabuse | 0.5% | 0.0% | 0.6% | 0.1% | 0.0% | 0.1% | 2.0% | 0.0% | 2.0% |
| Naltrexone | 3.7% | 0.0% | 4.1% | 0.1% | 0.0% | 0.2% | 5.2% | 0.0% | 5.3% |
| **Oklahoma** | | | | | | | | | |
| Number of Medicaid MD/SUD client with psychotropic drug prescriptions | 1,468 | 350 | 1,118 | 13,986 | 6,209 | 7,777 | 151 | 5 | 146 |
| Mean psychotropic drug prescriptions per Medicaid client with such claims | 7.0 | 6.5 | 7.2 | 7.9 | 6.3 | 9.3 | 5.2 | 1.2 | 5.3 |
| Percent of such clients with prescriptions for: | | | | | | | | | |
| Antidepressants | 73.7% | 82.3% | 71.0% | 57.6% | 45.0% | 67.6% | 49.0% | 40.0% | 49.3% |
| Antipsychotics | 33.4% | 32.6% | 33.6% | 23.6% | 13.9% | 31.3% | 12.6% | 0.0% | 13.0% |
| Barbiturates | 1.2% | 0.6% | 1.4% | 1.7% | 0.6% | 2.6% | 5.3% | 20.0% | 4.8% |
| Benzodiazepines | 31.5% | 4.3% | 40.0% | 21.7% | 2.4% | 37.1% | 41.7% | 0.0% | 43.2% |
| Lithium | 5.9% | 2.6% | 6.9% | 3.2% | 1.3% | 4.7% | 2.0% | 0.0% | 2.1% |
| Other anxiolytics/sedatives/hypnotics | 24.9% | 16.3% | 27.6% | 18.8% | 11.5% | 24.7% | 19.9% | 40.0% | 19.2% |
| Stimulants | 6.8% | 23.7% | 1.5% | 31.4% | 68.2% | 2.1% | 0.0% | 0.0% | 0.0% |
| Methadone | 0.4% | 0.0% | 0.5% | 0.1% | 0.0% | 0.2% | 0.7% | 0.0% | 0.7% |
| Antabuse | 0.3% | 0.0% | 0.4% | 0.0% | 0.0% | 0.1% | 0.0% | 0.0% | 0.0% |
| Naltrexone | 1.0% | 0.3% | 1.3% | 0.1% | 0.0% | 0.2% | 3.3% | 0.0% | 3.4% |
| **Washington** | | | | | | | | | |
| Number of Medicaid MD/SUD client with psychotropic drug prescriptions | 3,797 | 331 | 3,466 | 34,278 | 7,715 | 26,563 | 1,350 | 108 | 1,242 |
| Mean psychotropic drug prescriptions per Medicaid client with such claims | 10.5 | 4.0 | 11.2 | 11.4 | 5.4 | 13.2 | 5.3 | 2.2 | 5.5 |
| Percent of such clients with prescriptions for: | | | | | | | | | |
| Antidepressants | 79.3% | 67.1% | 80.4% | 64.7% | 32.7% | 74.0% | 64.9% | 48.2% | 66.3% |
| Antipsychotics | 25.5% | 8.5% | 27.2% | 26.7% | 5.0% | 33.0% | 3.3% | 0.9% | 3.5% |
| Barbiturates | 0.0% | 0.0% | 1.5% | 0.9% | 0.2% | 1.0% | 3.0% | 3.7% | 2.9% |
| Benzodiazepines | 37.7% | 4.8% | 40.9% | 27.2% | 3.2% | 34.2% | 37.3% | 5.6% | 40.1% |
| Lithium | 10.1% | 8.5% | 10.3% | 8.2% | 2.8% | 9.7% | 1.5% | 3.7% | 1.3% |
| Other anxiolytics/sedatives/hypnotics | 30.2% | 9.7% | 32.1% | 18.4% | 8.2% | 21.4% | 28.5% | 25.0% | 28.8% |
| Stimulants | 4.7% | 30.8% | 2.2% | 18.1% | 72.2% | 2.4% | 2.4% | 20.4% | 0.9% |
| Methadone | 1.9% | 0.0% | 2.1% | 0.5% | 0.0% | 0.7% | 3.0% | 0.9% | 3.2% |
| Antabuse | 2.9% | 0.3% | 3.2% | 0.3% | 0.0% | 0.4% | 3.4% | 2.8% | 3.5% |
| Naltrexone | 1.1% | 1.2% | 1.1% | 0.1% | 0.1% | 1.0% | 1.6% | 0.0% | 1.7% |

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

**Table B.5.1: Total expenditures (unduplicated, upper bound[a] between Medicaid and MH/SA agencies) by age group, State, and type of disorder for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Total MI and/or SA clients | | | Total State spending (excluding BH capitation) | | | Spending per client (excluding BH capitation) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Youth | Adult | Total | Youth | Adult | Total | Youth | Adult |
| Delaware | | | | | | | | | |
| MI&SUD | 2,397 | 220 | 2,177 | $26,011,080 | $2,806,872 | $23,204,209 | $10,852 | $12,759 | $10,659 |
| MI only | 11,345 | 5,187 | 6,158 | $66,396,918 | $25,933,696 | $40,463,222 | $5,853 | $5,000 | $6,571 |
| SUD only | 4,727 | 122 | 4,605 | $12,633,650 | $208,599 | $12,425,051 | $2,673 | $1,710 | $2,698 |
| Oklahoma | | | | | | | | | |
| MI&SUD | 15,604 | 1,701 | 13,903 | $83,902,053 | $10,780,904 | $73,121,149 | $5,377 | $6,338 | $5,259 |
| MI only | 63,405 | 23,525 | 39,880 | $162,508,141 | $63,100,808 | $99,407,333 | $2,563 | $2,682 | $2,493 |
| SUD only | 11,313 | 1,227 | 10,086 | $15,768,580 | $1,506,941 | $14,261,639 | $1,394 | $1,228 | $1,414 |
| Washington | | | | | | | | | |
| MI&SUD | 10,388 | 1,463 | 8,925 | $59,122,240 | $8,424,489 | $50,697,751 | $5,691 | $5,758 | $5,680 |
| MI only[b] | 109,136 | 40,090 | 69,046 | $350,020,463 | $94,429,489 | $255,590,974 | $3,207 | $2,355 | $3,702 |
| SUD only | 34,782 | 5,653 | 29,129 | $51,572,416 | $7,580,337 | $43,992,078 | $1,483 | $1,341 | $1,510 |
| Total | 263,097 | 79,188 | 183,909 | $827,935,541 | $214,772,136 | $613,163,406 | $3,147 | $2,712 | $3,334 |

[a]Upper/lower bounds were set by choosing the maximum/minimum number of units (days, visits, or claims) that were recorded separately by the MH/SA and Medicaid agency tracking systems for client shared services (that is, when service records had identical client identifiers and types of service and had identical or overlapping dates) plus client non-shared service units.
[b]Washington expenditures for clients with MI only were understated because Washington records did not include spending on residential services for those clients.

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

**Table B.5.2-5.4: Expenditures per client (unduplicated, upper bound[a] between Medicaid and MH/SA agencies) by type of service, age group, State, and type of disorder for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Total spending per client with any services | | Inpatient spending per client with such service | | Residential spending per client with such service[b] | | Outpatient spending per client with such service | | Retail prescription drug spending per Medicaid client with such service | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Youth | Adult | Youth | Adult | Youth | Adult | Youth | Adult | Youth | Adult |
| Delaware | | | | | | | | | | |
| MI&SUD | $12,759 | $10,659 | $10,640 | $16,911 | $13,706 | $11,096 | $5,224 | $4,535 | $214 | $672 |
| MI only | 5,000 | 6,571 | 19,518 | 42,760 | 14,867 | 17,743 | 2,584 | 1,747 | 259 | 602 |
| SUD only | 1,710 | 2,698 | 5,283 | 5,124 | 9,215 | 5,509 | 776 | 1,907 | 4 | 196 |
| Oklahoma | | | | | | | | | | |
| MI&SUD | 6,338 | 5,259 | 14,010 | 6,197 | 3,812 | 3,722 | 2,031 | 2,954 | 373 | 367 |
| MI only | 2,682 | 2,493 | 16,971 | 5,459 | 1,554 | 4,061 | 1,593 | 1,713 | 255 | 500 |
| SUD only | 1,228 | 1,414 | 9,413 | 2,264 | 4,185 | 2,243 | 311 | 891 | 44 | 176 |
| Washington | | | | | | | | | | |
| MI&SUD | 5,758 | 5,680 | 8,982 | 7,499 | 4,358 | 2,280 | 3,701 | 2,591 | 177 | 491 |
| MI only | 2,355 | 3,702 | 19,279 | 18,069 | b | b | 1,889 | 1,964 | 210 | 746 |
| SUD only | 1,341 | 1,510 | 9,541 | 7,159 | 3,872 | 1,601 | 708 | 983 | 103 | 129 |

[a]Upper/lower bounds were set by choosing the maximum/minimum number of units (days, visits, or claims) that were recorded separately by the MH/SA and Medicaid agency tracking systems for client shared services (that is, when service records had identical client identifiers and types of service and had identical or overlapping dates) plus client non-shared service units.

[b]The MH and Medicaid agencies in Washington did not maintain records for residential services; the SA agency in Washington did.

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

**Table B.5.5: Total number of clients (unduplicated between Medicaid and MH/SA agencies) by type of service, age group, State, and type of disorder for clients with treatment for co-occurring mental illness and substance-use disorders (MI&SUD), mental illness only (MI only), and substance-use disorders only (SUD only), 1997**

| | Total clients | | Total inpatient clients | | Total residential clients[b] | | Total outpatient clients | | Total prescription drug clients | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Youth | Adult | Youth | Adult | Youth | Adult | Youth | Adult | Youth | Adult |
| Delaware | | | | | | | | | | |
| MI&SUD | 220 | 2,177 | 40 | 694 | 89 | 193 | 220 | 1,973 | 57 | 564 |
| MI only | 5,187 | 6,158 | 282 | 615 | 481 | 152 | 4,932 | 5,775 | 2,068 | 2,292 |
| SUD only | 122 | 4,605 | 4 | 150 | 11 | 585 | 111 | 4,401 | 2 | 203 |
| Oklahoma | | | | | | | | | | |
| MI&SUD | 1,701 | 13,903 | 449 | 3,068 | 256 | 3,637 | 1,666 | 13,583 | 352 | 1,211 |
| MI only | 23,525 | 39,880 | 1,325 | 2,998 | 1,317 | 2,899 | 23,212 | 39,282 | 6,263 | 7,940 |
| SUD only | 1,227 | 10,086 | 10 | 123 | 263 | 2,886 | 1,003 | 8,392 | 7 | 173 |
| Washington | | | | | | | | | | |
| MI&SUD | 1,463 | 8,925 | 184 | 2,573 | 304 | 3,022 | 1,456 | 8,781 | 333 | 3,601 |
| MI only | 40,090 | 69,046 | 897 | 5,631 | b | b | 39,974 | 68,036 | 7,740 | 27,120 |
| SUD only | 5,653 | 29,129 | 16 | 698 | 982 | 10,003 | 5,100 | 23,118 | 131 | 1,943 |

[b]The MH and Medicaid agencies in Washington did not maintain records for residential services; the SA agency in Washington did.

Source: IDB Expenditure Study of Co-Occurring Disorders, 2007

DHHS Publications No. (SMA) 07-4263
Substance Abuse and Mental Health Services Administration
Printed 2007